ENVIRONMENTAL LEVELS OF POLYCHLORINATED DIBENZODIOXINS AND DIBENZOFURANS IN AMBIENT AIR AT SELECTED MONITORING SITES IN ALBERTA

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Environmental Levels of Polychlorinated Dibenzodioxins and Dibenzofurans in Ambient Air at Selected Monitoring Sites in Alberta

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Dedicated to

Arthur Bollo-Kamara

Project Coordinator

1950 - 2002

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GLOSSARY OF CHEMICAL ABBREVIATIONS

PCDD	Polychlorinated dibenzodioxin
PCDF	Polychlorinated dibenzofuran
TCDD	Tetrachlorinated dibenzodioxin
TCDF	Tetra chlorinated dibenzofuran
PeCDD	Pentachlorinated dibenzodioxin
PeCDF	Pentachlorinated dibenzofuran
HxCDD	Hexachlorinated dibenzodioxin
HxCDF	Hexachlorinated dibenzofuran
HpCDD	Heptachlorinated dibenzodioxin
HpCDF	Heptachlorinated dibenzofuran
OCDD	Octachlorinated dibenzodioxin
OCDF	Octachlorinated dibenzofuran
13C	Carbon 13-labelled-
37Cl-	Chlorine 37-labelled
PCB	Polychlorinated Biphenyl

SUMMARY

This report presents the levels of PCDD/PCDF in ambient air as measured during the 1997 and 1998 sampling years at selected sites across Alberta.

Levels of PCDD/PCDF in ambient air were measured at selected potential impact sites across Alberta during the 1997 and 1998 sampling years. These target sites, selected in collaboration with the project coordinator, were chosen to give a mix of sites that included urban and rural sites, industrial and residential sites, and other potential impact sites based on various types of industrial activity and possible sources of dioxin and furan emissions. The sites studied during the 1997 sampling year were Fort McMurray, Swan Hills, Wainwright, Calgary, Joffre, Edmonton, Fort Saskatchewan and Vegreville. Sites studied during the 1998 sampling year were Calgary, Exshaw, Swan Hills, Edmonton, Wainwright, Edmonton West and Fort Saskatchewan. During the 1997 sampling year, the samples were analyzed for dioxins and furans; samples from 1998 were analyzed for dioxins, furans, dioxin-like compounds, and polychlorinated biphenyls (PCBs). Results are provided in individual table form and compared graphically.

The results indicate that PCDD/PCDF levels in ambient air are higher in urban than rural areas. Also, within a given urban area, the PCDD/PCDF levels are higher in areas of industrial activity than in residential areas (although detectable levels are found at both types of sites.) This is consistent with trends reported in the U.S. (Riggs et al., 1996) and in Spain (Abad et al., 1997).

As the 1998 data included dioxin-like PCB compounds, the data was evaluated as the sum of toxicity equivalency factors (TEQ) for both PCDD/PCDF and dioxin-like PCBs for all the sites sampled. Total TEQ for all samples ranged from non-detected to 0.48 pg/m^3. This is much lower than the CCME guideline of 5.0 pg/m^3 (now adopted by the Ontario Ministry of Environment).

Both PCDD/PCDF and PCBs were detected in the three main industrial areas sampled: Swan Hills, Wainwright and Fort Saskatchewan. Samples from Swan Hills contained the highest levels, with concentrations of PCDD/PCDF and PCB higher in close proximity to waste treatment plants than in residential areas of each town. This trend is in reasonable agreement with data from other areas of Canada and the U.S., as reported in the literature.

Significant concentrations of PCDD/PCDF and PCBs are present in the urban areas of Calgary and Edmonton. Possible sources include industrial activity, waste treatment, waste transport and handling, and gasoline and diesel-powered vehicles. Sampling at regular intervals throughout the year will be necessary, to develop a complete picture of ambient levels in air across Alberta. More studies will be required to identify the various sources that contribute to overall levels of PCDD/PCDF and PCBs in the environment.

1.0 INTRODUCTION

The project consisted of selecting potential impact sites across Alberta and performing field sampling at these sites for determination of dioxins and furans.

After the completion of the 1997 sampling year it was decided to include the dioxin-like compounds such as PCBs in the list. Some PCB isomers are considered to have similar toxicity to PCDD/PCDF. Hence the decision to sample during the 1998 sampling season for PCDD/PCDF and PCBs, assessing the data for toxicity of PCDD/PCDF and PCB – individually and as a group of compounds – and also to assess the issue of dioxin-like toxic compound, including PCBs that met this criterion.

Sampling Site Selection

1997 Sampling Year
Fort McMurray, Swan Hills, Wainwright, Calgary, Joffre, Edmonton, Fort Saskatchewan and Vegreville.

1998 Sampling Year
Swan Hills, Wainwright, Calgary, Exshaw, Edmonton South, Edmonton West and Fort Saskatchewan.

These sites were chosen to give a mix of sites including urban and rural sites, industrial and residential sites and potential impact sites based on various types of industrial activity. Data were not available except for specific investigations carried out by AENV in response to alleged contraventions of dioxin emissions limits, e.g., Swan Hills, slow-release stack data (October 1996) and a July 1997 incident.

Some sites were included during both sampling years; others were sampled in 1997 only. A couple of new sites were added to the 1998 sampling year after careful evaluation and discussion of the results obtained in 1997.

2.0 MATERIALS AND METHODS

2.1 Sampling Equipment and Protocol

2.1.1 Sampling Pump

A General Metal Works (GMW) model PS-1 high-volume sampling pump was used in these experiments. Two Graseby Model GPS1 polyurethane foam (PUF) sampler units were purchased from Graseby GMW, 145 South Miami Avenue, Village of Cleves, OH 45002 through ENTECH Corporation of Calgary. These pumps were bought complete with the sampling heads that house the PUF cartridge and a high-volume orifice calibrator (Model G40A). Pumps were calibrated on the ARC Vegreville site using the procedure described in the Graseby operator's manual. Airflow through the sampling system is monitored by a magnehelic

assembly and pumps have to be recalibrated at least once every three months or after sampling for 360 hours (Appendix 2).

2.1.2 Polyurethane Foam (PUF) Cartridges

PUF cartridges used in this study were cut at the laboratory site using a cutter designed in-house. Cartridges were cut to fit the size of the glass cylinder sampling head (2.25 inch diameter and 3.75 inches deep.) Cartridges were cleaned in batches of six by soxhlet extraction with acetone followed by a 16-hour extraction with 5% ether in hexane.

Cartridges were air dried and loaded into the head of the PS-1 sampler. A representative PUF cartridge from each batch was proved clean by extracting it and analyzing the extract using the gas chromatograph equipped with an electron capture detector. (A blank level of less than 10 ng per single component is considered acceptable for field use of the PUF cartridges.)

Cartridges were all stored under dark conditions in individual mason jars (exposure of cartridges to light can change their color slightly.) The corresponding Pallflex glass fiber filters were purchased from Fluid Clarifications Inc. of Calgary and cut in-house to fit the glass sampling head's cartridge holder. Filters were cleaned collectively in the sonic extractor overnight using hexane as solvent. Filter extract was also proved clean by analyzing it on the gas chromatograph using an identical procedure to that of the PUF cartridge.

2.1.3 Sample Collection

Sampling pumps were calibrated at the Vegreville laboratory site prior to field sample collection, with PUF cartridges stored in individual mason jars and kept in the refrigerator of the ARC mobile laboratory van along with solvents, gloves, and temperature and pressure measuring devices, plus hardware, tools, wooden planks, necessary glassware, extension cords and other general supplies.

Sample heads were cleaned at the ARC Vegreville laboratory site and sampling cartridges installed. Any changes of sampling heads and the PUF cartridges in the field were carried out in the mobile laboratory, using clean glassware and tools.

Once a field site was selected, contacts were made with AENV personnel to ascertain if there was an AENV sampling site near the selected location and /or whether AENV field personnel could provide on-site technical assistance during setup and installation of the pumps and to watch over the progress of sampling, which usually lasted 24-30 hours. A minimum of 300 m^3 of ambient air samples was collected at each site.

In collaboration with AENV field personnel (and in some cases with municipal authorities), two sampling sites were usually selected. A visual inspection of each was carried out to locate the sampling pump safely and securely – if possible close to an electrical outlet or connected to a power generator in the mobile lab.

Samplers were located in an unobstructed area away from any obstacle to airflow. Pumps were installed on a wooden plank and weighted with sandbags. The pump's exhaust hose was stretched out downwind (to prevent recycling of air.)

If not already done at Vegreville, a clean PUF cartridge was removed from the sealed transport containers and placed in the sampling head using forceps and gloves. Using a clean syringe, 1 ng of $37Cl_4$-2,3,7,8-TCDD solution was injected into the PUF cartridge. (This solution was supplied by EnviroTest Laboratories as a surrogate in a clean sealed ampoule. The ampoule was rinsed with toluene and injected on to the PUF cartridge.

The sampling head was then assembled and installed on the top of the PS-1 sampler. The zero reading of the magnehelic was checked and ambient temperature, barometric pressure, elapsed time meter setting and PUF cartridge number were recorded. The voltage variator and flow control valve were set and the power switch turned on. The time meter was activated and start time was recorded. Flow was adjusted using the magnehelic setting, if necessary, using the flow control valve.

During the minimum 24-hour sampling period, the magnehelic reading was checked and recorded three or four times, along with the temperature and barometric pressure. These data were later used in conjunction with the sampling pump calibration data to calculate – in cubic metres – the total amount of air sampled.

At the end of the sampling period, power was turned off and filters and cartridges were placed in sealed-labeled containers and stored in the refrigerator. A field blank was also returned to the laboratory in the same manner, but without air being drawn through it. Samples were transported to the laboratory and stored in a refrigerator. The samples were usually extracted within a week of their collection. Table 1 provides details of these samples, their location, site address and volume of air sampled.

2.2 Extraction, Cleanup and Analysis

PUF cartridge and filter were extracted together using a soxhlet extractor. Clean soxhlet apparatus was set up in a fume hood and samples extracted in batches of five. Cartridges and filters were taken out of the refrigerator, the cartridge was spiked with the 13C-labelled PCDD/PCDF surrogate mixture (1997 sampling year) and the 13C-labelled PCDD/PCDF and PCB surrogate mixture (1998 sampling year) supplied by the contract laboratory for quality assurance purposes.

Cartridges and filter were put together in the soxhlet apparatus, already charged with 250 mL of 5% ether-in-hexane solution. Extraction was carried out for a minimum of 16 hours at a minimum rate of three cycles an hour. The final extract was concentrated to about 1 mL using a rotary evaporator.

Concentrated extracts were cleaned up using Environment Canada's recommended two-step, two-column approach, one column with the acid/base/silver nitrate/silica and the other a basic aluminum. Cleanup schematic is shown in Figure 1, and the cleanup columns are in Figure 2.

Details of reagent preparation, materials, the two column and exact technical protocol are in Appendix 3. The contract laboratory also performed additional one-step cleanup as necessary, for selected samples.

Final extracts were exchanged in hexane and blown to dryness in a 200-μL vial, crimp-top sealed and submitted for high-resolution mass spectrometric analysis.

Analysis, determination and confirmation of dioxins and furans were performed on Kratos concept 1S32 HRMS (high-resolution mass spectrometer) using a 60-m J&W DB-5 column.

2.3 Quality Assurance

Established quality control protocols were observed for handling, cleaning and storage of glassware used in the study. Pumps were calibrated before use in the field. All solvents used were of high grade and distilled in glass. The quality control procedure included preparation, cleaning and proofing of individual PUF cartridges.

Carbon-13-labelled PCDD/PCDF and PCB surrogate mixtures were added to each sample prior to extraction. Final results for each sample were corrected for percentage recovery of these surrogate mixture congeners.

Table 1 Sample Identification

Sampling Year	Site	Sample No.[H]	Location	Address	Vol, m^3	Filter*	Data Table No.
1997	Calgary	CA1118-01	Queens Court Roof	Downtown	342.50	3	8
1997	Calgary	CA1118-02	Industrial	Environment	336.37	4	9
1998	Calgary	CA0730-01	Industrial	Environment	322.89	4	10
1998	Calgary	CA0730-02	Queens Court Roof	Downtown	305.08	4	11
1997	Edmonton	ED1125-01	Industrial	17 St.	341.67	4	12
1997	Edmonton	ED1125-02	Residential	127 St. 133 Ave	325.86	4	13
1998	Edmonton	EC0915-01	Industrial	17 St.	333.96	4	14
1998	Edmonton	ED0915-02	Residential	127 St. 133 Ave.	323.59	4	15
1998	Edmonton West	ED1021-01	Reimer	160 St. 128 Ave.	373.47	4	16
1998	Edmonton West	ED1021-02	Reimer	160 St. 128 Ave.	357.24	4	17
1998	Exshaw	EX0731-01	Wildlife Lot	Exshaw	313.40	1	18
1998	Exshaw	EX0731-02	Wildlife Lot	Exshaw	316.51	1	19
1997	Fort McMurray	FM1028-01	Environmental Protection	Downtown	407.43	1	20
1997	Fort McMurray	FM1028-02	Timberlea	Residential	384.59	1	21
1997	Fort Saskatchewan	FS1126-01	Industrial	Environment	357.78	3	22
1997	Fort Saskatchewan	FS1126-02	City Hall Roof	Downtown	383.66	3	23
1998	Fort Saskatchewan	FS1006-01	Industrial	Environment	341.40	3	24
1998	Fort Saskatchewan	FS1006-02	Industrial	Environment	374.08	3	25
1997	Joffre	JO1119-01	Joffre Downtown	North Cord	366.16	2	26
1997	Joffre	JO1119-02	Joffre Downtown	South Cord	346.70	2	27
1997	Swan Hills	SH1104-01	Hospital Roof	Hospital	351.63	1	28
1997	Swan Hills	SH1104-02	Town Office Parking Lot	Downtown	332.97	1	29
1998	Swan Hills	SH0909-01	Bovar	Weather Station	328.56	1	30
1998	Swan Hills	SH0909-02	Bovar	Weather Station	354.80	1	31
1997	Vegreville	VE1203-01	ARC	North Cord	352.22	1	32
1997	Vegreville	VE1203-02	ARC	South Cord	332.18	1	33
1997	Wainwright	WT1113-01	Hospital Roof	Hospital	376.84	1	34
1997	Wainwright	WT1113-02	RCMP Parking Lot	RCMP	355.56	1	35
1998	Wainwright	WT0930-01	Waste Treatment Plant	Wainwright	331.85	2	36
1998	Wainwright	WT0930-02	Waste Treatment Plant	Wainwright	355.38	2	37
1997	Fort McMurray	FM1028-BL	Blank				38
1997	Fort McMurray	FM1028-SP	Spike				39
1997	Fort Saskatchewan	FS1126-BL	Blank				40
1997	Vegreville	VE1203--BL	Blank				41
1997	Wainwright	WT1113-BL	Blank				42
1997	Vegreville	VE1216-GB	Glassware Blank				43
1998	Vegreville	VE0930-GB	Glassware Blank				44
1998	Vegreville	VE0930-SP	Spike				45
1998	Vegreville	VE1214-01	PUF Blank #1				46
1998	Vegreville	VE1214-02	PUF Blank #2				47

[H] First two digits signify the site; next four digits depict the month and date of sampling and the last two digits signify the sample number.

*Filter Note

1 = Relatively Clean 2 = Medium 3 = Dark 4 = Very Dark

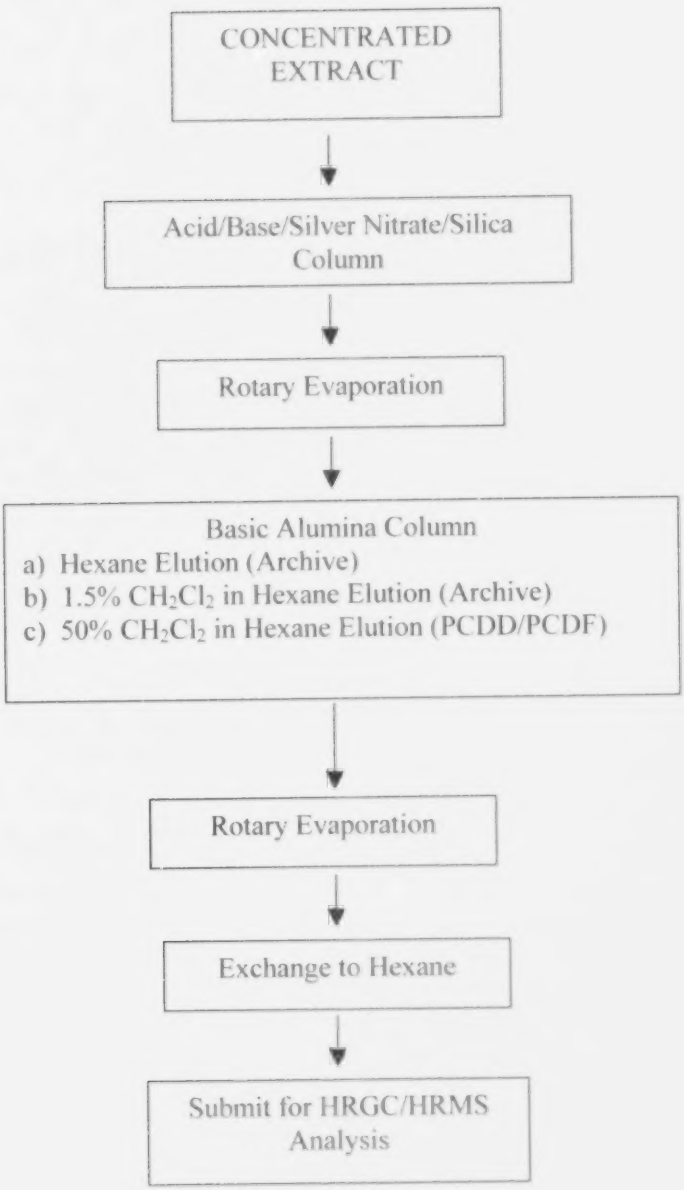

Figure 1 **Cleanup and Analysis Schematic for PCDDs/PCDFs**

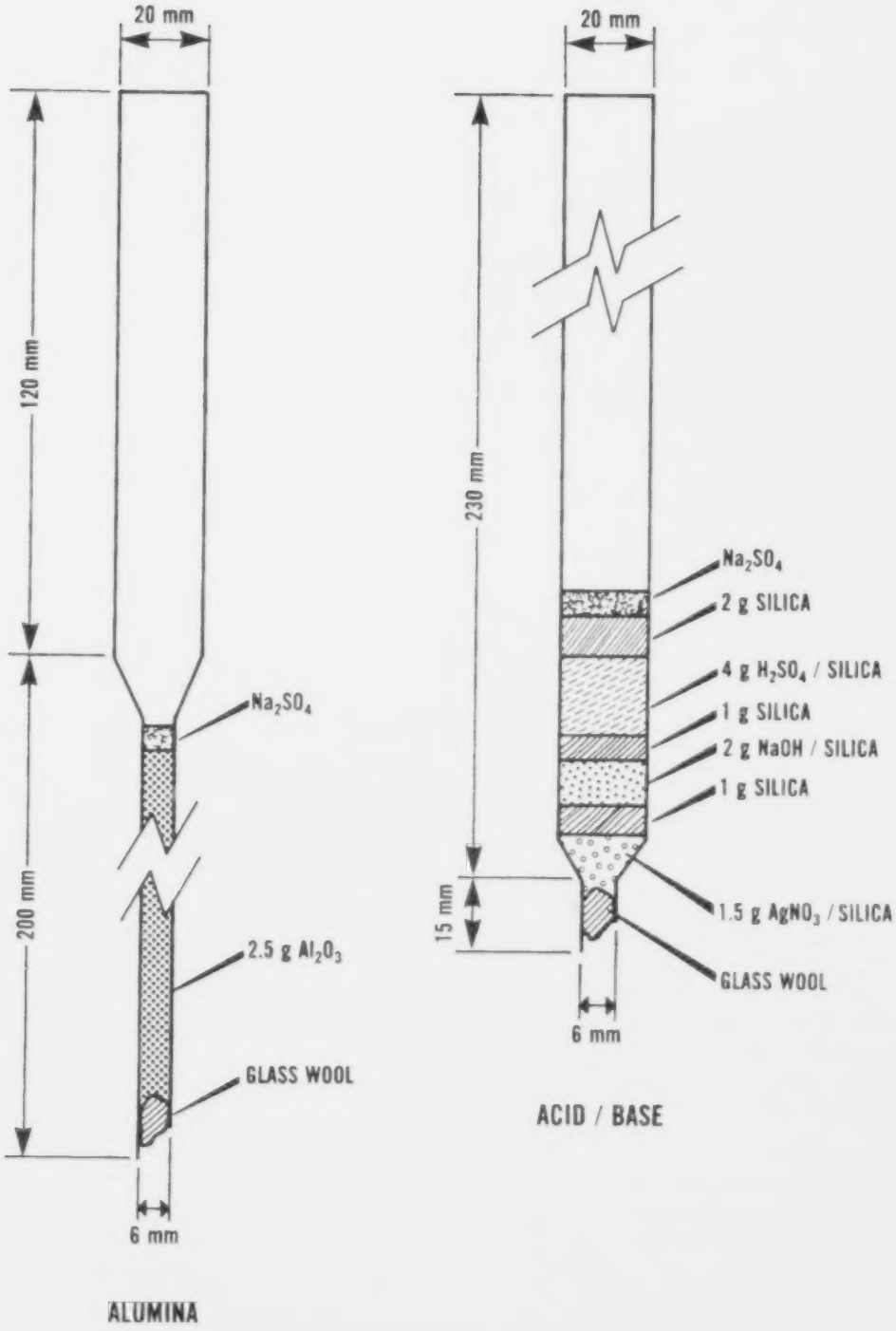

Figure 2 **Cleanup Columns**

3.0 RESULTS AND DISCUSSION

Detailed analytical results for PCDD/PCDF and PCBs in ambient air at different sites across Alberta during the sampling years 1997 and 1998 are tabulated in Appendices 4, 5, and 6. These tables include blank samples, spiked samples and other quality assurance data. For the purpose of the present discussion, reference is made primarily Table 2 data on PCDD/PCDF and dioxin-like PCBs in total TEQ, pg/m^3 and in total PCB data in pg/m^3.

Variability between samples at a given location on different sampling days can be attributed to local meteorological conditions and the nature of waste treatment or other emissions-generating activities.

3.1 PCDD/PCDF Data

Results for PCDD/PCDF are given in Appendix 4, expressed in two ways—the 2, 3, 7, 8 - substituted PCDD/PCDF congeners and non 2, 3, 7, 8- substituted homologues.

Reason for analyzing and reporting like this is because only 2, 3, 7, 8 - substituted PCDD/PCDF congeners are considered toxic and these homologues have been assigned toxicity equivalency factors (TEF) ranging from 0.001 to 1.0.

Internationally accepted TEF values seen in Table 3, were used to calculate the toxicity equivalent (TEQ) values shown in Table 2 and Tables A1-A10 in Appendix 4.

Data for the non 2, 3, 7, 8-substituted PCDD/PCDF congeners are given on the right-hand side of the tables in Appendix 4.

Results in Appendix 4 are expressed in units of femtograms per cubic meter (fg/m^3) of ambient air and have been corrected for surrogate recoveries of the carbon-13-labelled PCDD/PCDF surrogate mixture. These percent surrogate recoveries are also given at the bottom of each table, for quality assurance and data evaluation purposes.

Some PCDD/PCDF congeners are reported as ND (not detected), while some are reported as NDR (congener was detected, but isotope ratio was incorrect and hence the values are deemed not detected.)

Note: for TEQ calculations, the total TEQ values include these congeners. This allows assessment of the data at the maximum possible TEQ value for each sample, hence ensuring that any error in assessing the environmental impacts of these compounds errs on the side of safety.

TEQ values for all samples collected in the 1997 and 1998 sampling years are represented graphically in Figures 3 and 4 respectively.

Samples were collected at Calgary and Edmonton during both the 1997 and 1998 sampling years. Data for two sites in each of these cities are presented in Figure 5 and in Table 2. Since

TEQ values are discussed in units of picograms per cubic meter (pg/m^3) in the international literature, these TEQ values have been converted to pg/m^3 for this discussion.

Data in Figure 5 and the tables in the appendices are listed in femtograms per cubic meter.

In Table 2, the total TEQ values from Calgary samples during the 1997 sampling period were 0.007 and 0.014 pg/m^3 for the Downtown and Industrial sites respectively, compared to 0.012 and 0.005 pg/m^3 during the 1998 sampling period. Distributions of individual compounds at the Calgary sites were comparable during the two sampling years.

Table 2 Summary of Principal Air Sampling Results *

Site	Site Location	Sampling Year	PCDD/PCDF (Total TEQ, pg/m^3)	Dioxin-Like PCBs (Total TEQ, pg/m^3)	Total PCBs (pg/m^3)
Calgary	Downtown	1997	0.007	-	-
		1998	0.012	0.276	24262.3
	Industrial	1997	0.014	-	-
		1998	0.005	0.0007	557.3
Edmonton	Industrial	1997	0.074	-	-
		1998	0.001	0.0005	251.5
	Residential	1997	0.022	-	-
		1998	0.155	0.0003	308.6
	Reimer	1998 (01)	0.163	0.011	321.7
		1998 (02)	0.070	0.007	140.1
Exshaw	Wildlife Lot	1998 (01)	0.0008	0.003	383.4
		1998 (02)	0.0008	0.0003	160.9
Fort McMurray	Downtown	1997	0.007	-	-
		-	-	-	-
	Residential	1997	0.0008	-	-
		-	-	-	-
Fort Saskatchewan	Downtown	1997	0.050	-	-
		-	-	-	-
	Industrial	1998 (01)	0.0008	0.0004	176.0
		1998 (02)	0.009	0.0006	347.6
Joffre	Residential	1997 (01)	0.005	-	-
		1997 (02)	0.003	-	-
Swan Hills	Hospital	1997	0.0006	-	-
		-	-	-	-
	Residential	1997	0.001	-	-
		-	-	-	-
	Bovar Waste	1998 (01)	0.049	0.031	1884.5
		1998 (02)	0.452	0.025	3380.3
Vegreville	North Side	1997	0.003	-	-

* Blank samples, spike samples, and other quality assurance samples are excluded

		-	-	-	-
	South Side	1997	0.005	-	-
		-	-	-	-
Wainwright	Hospital	1997	0.001	-	-
		-	-	-	-
	Downtown	1997	0.005	-	-
		-	-	-	-
	Waste Treatment	1998 (01)	0.387	0.013	159.6
		1998 (02)	0.110	0.0002	450.7

Table 3 Toxicity Equivalency Factors for Specific PCDD and PCDF Congeners

Homologue	Positions Chlorinated	Equivalency Factor
T_4CDD	2,3,7,8	1
P_5CDD	1,2,3,7,8	0.5
H_6CDD	1,2,3,4,7,8	0.1
	1,2,3,6,7,8	0.1
	1,2,3,7,8,9	0.1
H_7CDD	1,2,3,4,5,7,8	0.01
O_8CDD	1,2,3,4,6,7,8,9	0.001
T_4CDF	2,3,7,8	0.1
P_5CDF	1,2,3,7,8	0.05
	2,3,4,7,8	0.5
H_6CDF	1,2,3,4,7,8	0.1
	1,2,3,7,8,9	0.1
	1,2,3,6,7,8	0.1
	2,3,4,6,7,8	0.1
H_7CDF	1,2,3,4,6,7,8	0.01
	1,2,3,4,7,8,9	0.01
O_8CDF	1,2,3,4,6,7,8,9	0.001

Samples were collected at the same sites for both years at the Edmonton Industrial (17 Street) site and Residential (127 Street – 133 Avenue) site. Relative PCDD/PCDF levels at these sites are depicted in Figure 5.

Samples from both the Industrial site and the Residential site contained 2,3,7,8-substituted congeners. Dioxins and furans were detected in samples from both sites during the 1997 sampling year; the total TEQ values were 0.074 and 0.022 pg/m^3

The corresponding TEQ values for the 1998 sampling year were 0.001 pg/m^3 (Industrial) and 0.155 pg/m^3 (Residential). Another Edmonton site, Edmonton Reimer, was added for the 1998 sampling year because of its proximity to a cement plant. Total TEQ values for the two samples collected at this site are 0.070 and 0.163 pg/m^3 respectively, and the samples did contain both the 2,3,7,8-substituted PCDD and PCDF congeners.

Edmonton appears to have higher levels of PCDD and PCDF in ambient air than Calgary, although detectable levels are present at both sites.

Samples from Exshaw (1998), collected a few hundred yards from the south end of the town near the cement plant, contained small amounts of 1,2,3,4,6,7,8-HpCDD and OCDD along with a trace of 1,2,3,4,6,7,8-HpCDF. Total TEQ values from these samples were 0.0008 pg/m^3.

Samples collected in the Fort McMurray Downtown area (1997) showed a total TEQ value of 0.007 pg/m^3, while sampling from the Residential site showed a much lower total TEQ value of 0.0008 pg/m^3.

Similar results were obtained from the two samples collected in downtown Joffre, where the total TEQ values were in the range of 0.003 to 0.005 pg/m^3.

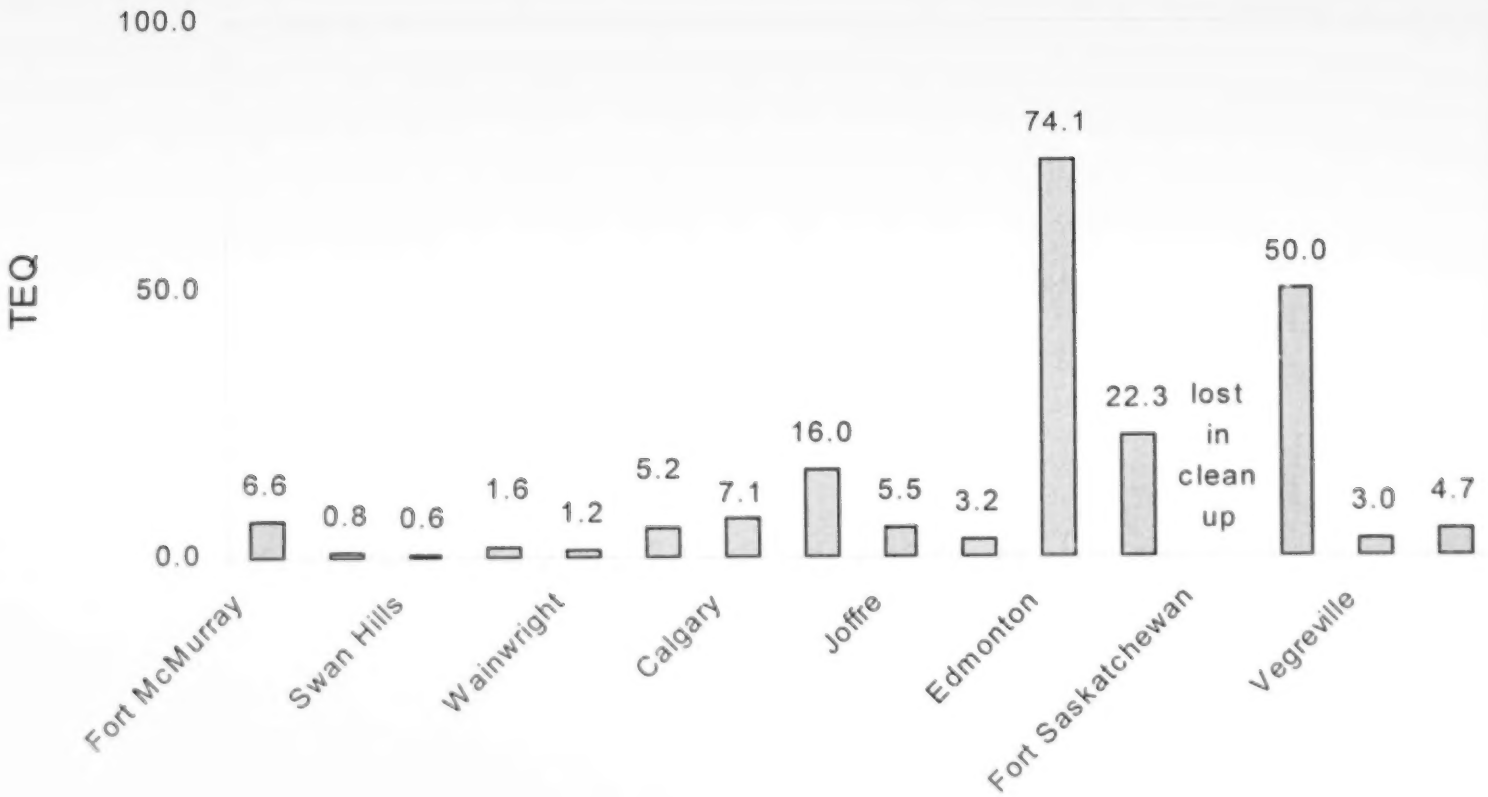

Figure 3 **PCDD/PCDF Levels at Various Sites (1997)**

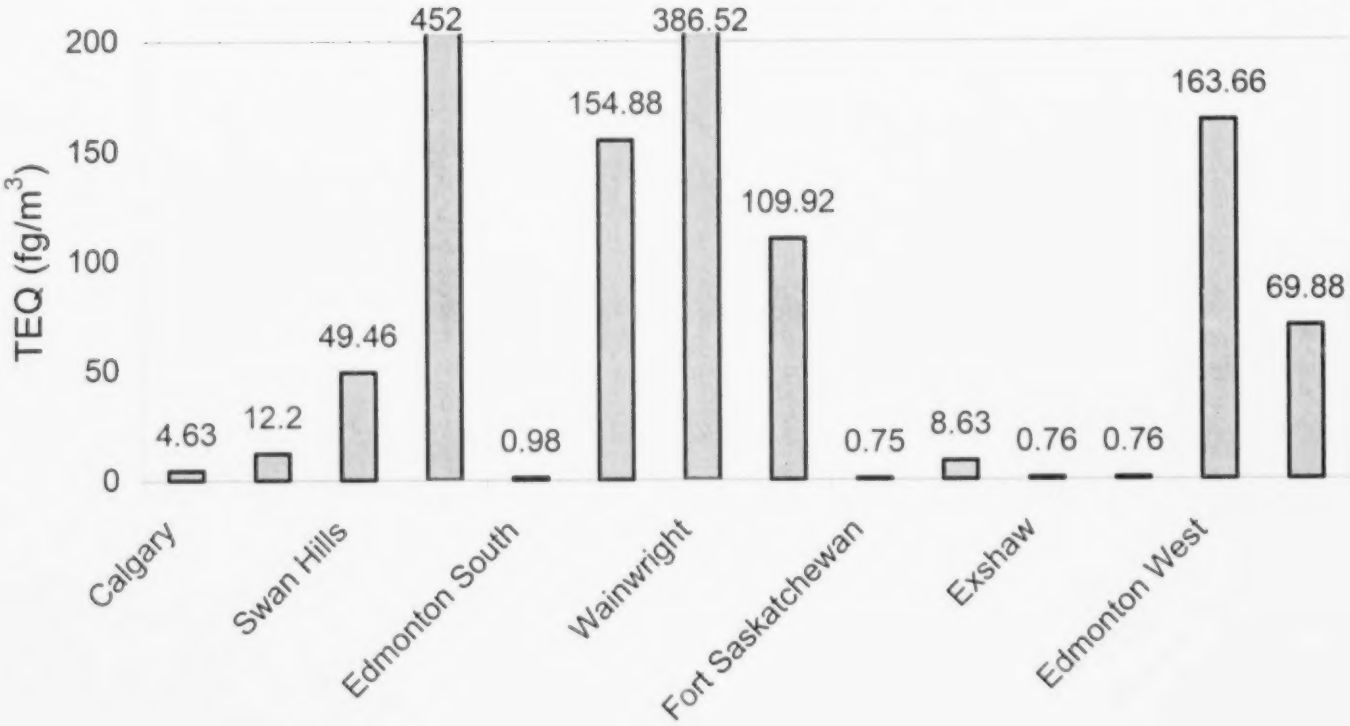

Figure 4 **PCDD/PCDF Levels at Various Sites (1998)**

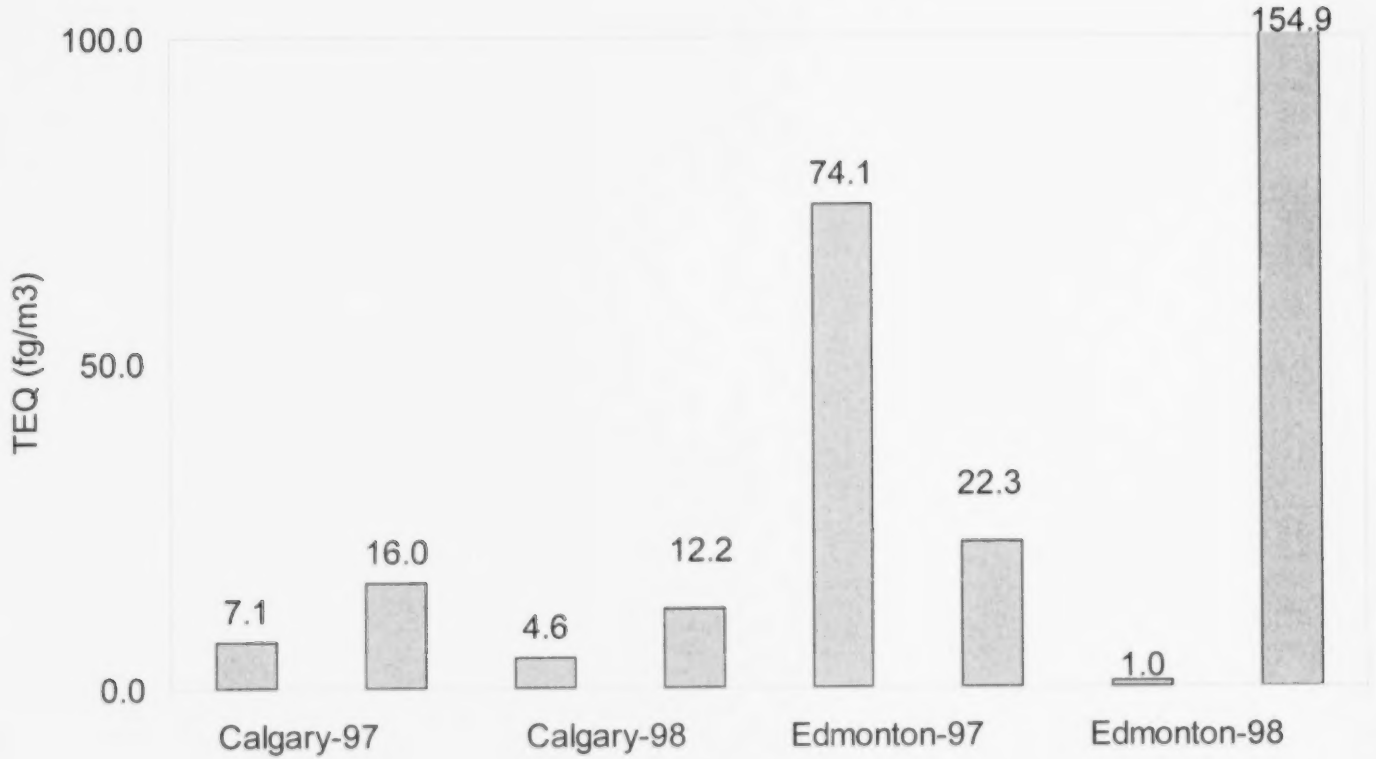

Figure 5 **PCDD/PCDF levels at Edmonton and Calgary sites (1997 and 1998)**

Samples were collected from Fort Saskatchewan Downtown and Industrial areas during the 1997 sampling year; only the Industrial site was sampled during 1998. The Downtown sample showed a couple of dioxin congeners in the range of 0.019-2.167 pg/m^3 and furan congeners in the range of 0.034-0.133 pg/m^3. Total TEQ value for this sample was 0.049 pg/m^3. Other samples from Fort Saskatchewan (1998) showed total TEQ values of 0.0008 and 0.009 pg/m^3.

Samples were collected from the Hospital and Residential sites at Swan Hills during the 1997 sampling period. Sampling in 1998 was done near the waste treatment plant. Residential samples showed mainly the OCDD congener and total TEQ values were at a 0.001-pg/m^3 level. Sampling from near the waste treatment plant detected a few 2,3,7,8-PCDD and PCDF congeners with corresponding total TEQ values of 0.049 and 0.452 pg/m^3.

At Wainwright, as at Swan Hills, sampling near the waste treatment plant resulted in higher TEQ values than Hospital or Residential samples. Several 2,3,7,8-PCDD and PCDF congeners were detected in both samples, with total TEQ values of 0.387 and 0.110 pg/m^3.

Detectable levels of PCDD and PCDF were found in the ambient air of all three towns with waste treatment and related industrial activities. Swan Hills and Wainwright samples had the highest concentrations in this industrial samples group, while Fort Saskatchewan had lower values.

No furans were detected in samples collected from sites at Vegreville, a relatively rural area. Very small amounts of 1,2,3,4,6,7,8-HpCDD and OCDD were detected, with total TEQ values of 0.003 and 0.005 pg/m^3.

3.2 Dioxin-like PCBs

Only the samples collected in the 1998 sampling year were analyzed for dioxin-like PCBs and total PCBs. Detailed results for determination of dioxin-like PCBs – also called coplanar PCBs – in the ambient air samples are given in Tables A41-A58. Only those PCB congeners that are assigned a toxicity equivalency factor by the WHO are included in these results.

The TEF values assigned to these PCB congeners, given in Table 4, are similar to the values assigned to PCDD and PCDF congeners. Results are expressed in units of femtograms per cubic meter (fg/m^3) as with the PCDD/PCDF data. Results have all been corrected for percentage surrogate recoveries of the carbon-13-labelled PCB surrogate mixture. These percent surrogate recoveries are also given at the bottom of each table for quality-assurance and data-evaluation purposes.

Some PCB congeners are reported as ND (not detected), while a few others are reported as NDR (see reasoning, above). As in the PCDD/PCDF data, total TEQ values are calculated to include all congeners present. TEQ values for the dioxin-like PCBs are also given in Table 2 and are represented pictorially in Figure 6.

Table 4 Toxicity Equivalency Factors for Dioxin-like PCBs

Congener No.	Positions Chlorinated	Toxicity Equivalency Factor
PCB 77	3,3',4,4'	0.0001
PCB 81	3,4,4',5	0.0001
PCB 105	2,3,3',4,4'	0.0001
PCB 114	2,3,4,4',5	0.0005
PCB 118	2,3',4,4',5	0.0001
PCB 123	2',3,4,4',5	0.0001
PCB 126	3,3',4,4',5	0.1
PCB 156	2,3,3',4,4',5	0.0005
PCB 157	2,3,3',4,4',5'	0.0005
PCB 167	2,3'4,4',5,5'	0.00001
PCB 169	3,3',4,4',5,5'	0.01
PCB 189	2,3,3',4,4',5,5'	0.0001

Samples from Exshaw contained PCB congeners 77, 105, 118, 123, 156, and 167 at femtogram per cubic meter levels, with total TEQ values of 0.33 and 3.04 fg/m^3. As with the PCDD/PCDF data, these are converted to pg/m^3 for comparison purposes, with total TEQ values of 0.0003 to 0.003 pg/m^3.

The two samples collected at Swan Hills contained all but two of the dioxin-like PCB congeners, with total TEQ values of 0.025 and 0.031 pg/m^3. Samples collected at Wainwright also contained a few PCB congeners, with total TEQ values of 0.013 and 0.0002 pg/m^3. Samples from Fort Saskatchewan gave total TEQ values of 0.0004 and 0.0006 pg/m^3. As observed for the PCDD/PCDF data, Swan Hills had higher levels than Wainwright or Fort Saskatchewan.

Both samples collected from Calgary contained the dioxin-like PCBs, with total TEQ values of 0.0007 and 0.28 pg/m^3 at the Industrial and Downtown sites respectively. Higher PCB emissions may be present at the Queens Court Calgary AENV sampling site because of PCBs coming from downtown industrial activity and diesel- and gasoline-powered vehicle emissions.

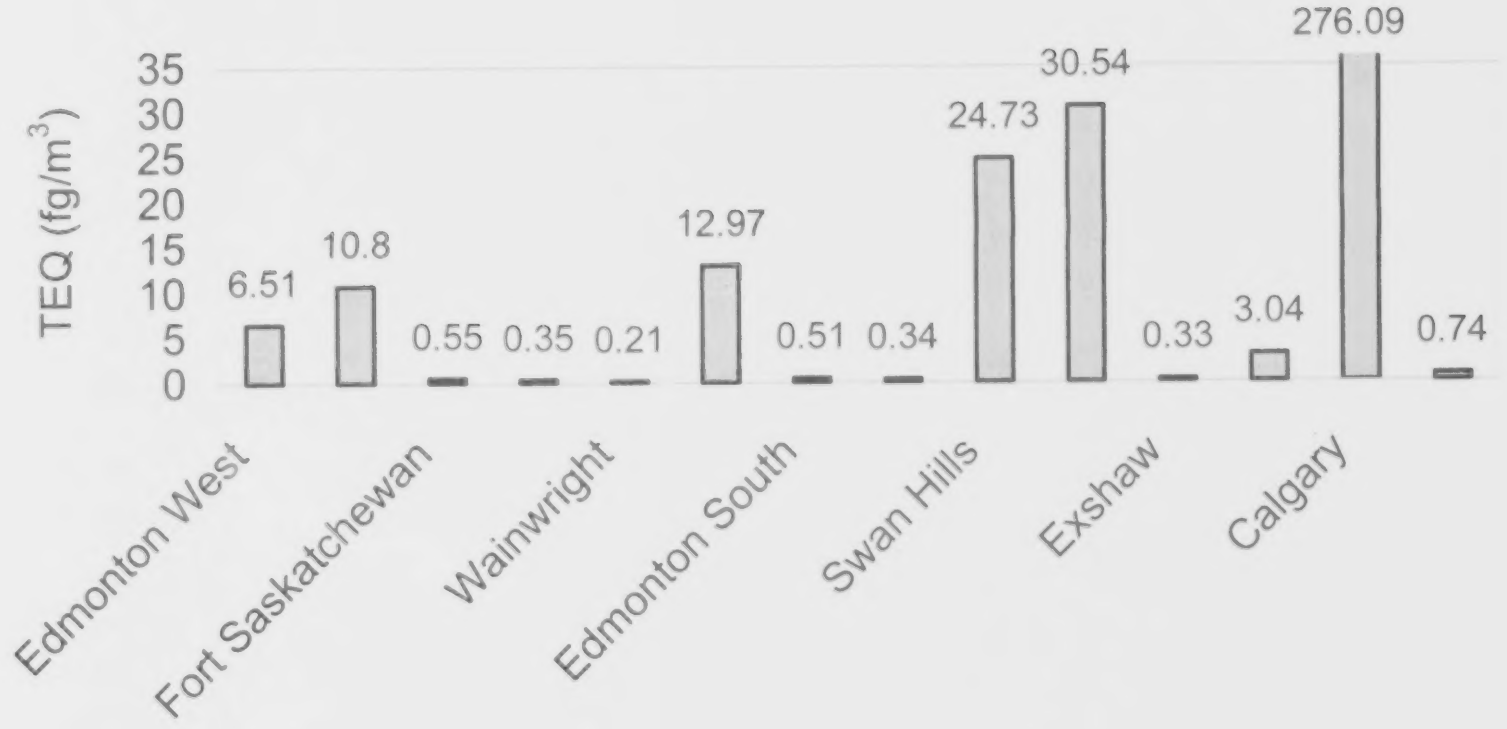

Figure 6 **Levels of Dioxin-like PCBs at Various Sites (1998)**

The total TEQ values from the Edmonton Industrial and Residential sites were 0.0005 and 0.0003 pg/m^3 respectively. The Edmonton Reimer site, however, had higher levels than Edmonton Industrial. Total TEQ values from the Edmonton Reimer sampling site were 0.011 and 0.007 pg/m^3.

3.3 Total PCBs

Detailed results for determination of total PCBs are given in Tables A59-A76 and summarized in Table 2. Total PCB data includes dioxin-like PCBs data.

Non-dioxin-like PCB congeners are not assigned a toxicity equivalency factor by the World Health Organization because they are not deemed to be as toxic to mammals as the dioxin-like PCBs and 2,3,7,8-substituted PCDD/PCDF congeners.

Total PCBs are, however, important environmental pollutants because of their presence in all compartments of the ecosystem. As levels of total PCBs detected the samples were relatively large (Tables A59-A76), the data are all expressed in units of pg/m^3.

Samples collected from Exshaw did contain PCBs at levels of 383.4 and 160.9 pg/m^3. Corresponding values from Swan Hills samples were 1884.5 and 3380.3 pg/m^3. PCB levels detected in the samples from Wainwright Waste Treatment Plant were 159.6 and 450.7 pg/m^3. Samples from the Fort Saskatchewan AENV site contained 176.0 and 347.6 pg/m^3 total PCB.

Sampling at the Calgary Industrial site detected total PCB of 557.3 pg/m^3 and at the Calgary Downtown site 24262.3 pg/m^3.

Samples collected from the Edmonton Industrial and Edmonton Residential sites contained total PCB levels of 251.5 and 308.6 pg/m^3, respectively. Corresponding values for total PCBs at the Edmonton Reimer site were 321.7 and 140.1 pg/m^3, not greatly different from PCB levels at the Edmonton Industrial site.

When this study was carried out, no general guidelines or regulations for PCDD/PCDF in ambient air had been set by either federal authorities or AENV. However, the Ontario Ministry of Environment had an ambient air quality criterion of 5.0 pg/m^3 TEQ for a 24-hour sample. In the samples collected under this project, the TEQ values ranged from not detected to 0.45 pg/m^3. These are well below the Ontario ambient air criterion.

4.0 CONCLUSIONS

Results indicate that the PCDD/PCDF levels in ambient air are higher in urban than in rural areas. Also, within the same urban area PCDD/PCDF levels are higher in the industrial activity areas than the residential areas, although detectable levels are found at both.

The 1998 data included the dioxin-like PCB compounds, so the results can be regarded as the sum of TEQ values for both PCDD/PCDF data and dioxin-like PCB data for all the sites sampled. This value is much lower than the 5.0 pg/m^3 Canadian Council of Environmental Ministers guideline, also adopted by the Ontario Ministry of Environment. The contribution of the dioxin-like PCBs to the total PCB numbers was small.

The three main industrial areas of Swan Hills, Wainwright and Fort Saskatchewan showed the presence of PCDD/PCDF and PCBs, with Swan Hills having the highest values. Concentrations of PCDD/PCDF and PCBs were higher in close proximity to the waste treatment plants than in residential areas.

Significant concentrations of PCDD/PCDF and PCBs are present in Calgary and Edmonton. Sources of these compounds may include industrial activity, waste treatment, waste transport and handling, and gasoline- and diesel-powered cars and commercial vehicles. Questions still exist about the spatial and temporal variations of these emissions in Alberta and the various sources that contribute to ambient levels.

APPENDICES

Appendix 1 Dioxins and Dioxin-like Compounds

Figure A1 Molecular structures of 'dioxin-like' compounds: (a) dibenzo-p-dioxin, (b) dibenzofuran and (c) biphenyl

Polychlorinated dibenzo-p-dioxins (PCDDs) refer to a family of compounds, as shown in Figure A.1.(a), where one to eight chlorine atoms have substituted for hydrogen atoms in positions denoted by the numerals 1 to 4 and 6 to 9. There are 75 distinct compounds, often referred to as congeners, depending on the number and positions of the chlorine substitutions. Similarly, Polychlorinated dibenzofurans (PCDFs) and polychlorinated biphenyls (PCBs) refer to families of compounds with structures shown in Figure A1 (b) and (c), respectively. The corresponding numbers of congeners are 135 and 209.

Instead of chlorine, bromine could be the substitute atoms, in which case the families are referred to as polybrominated dibenzo-p-dioxins (PBCDs), polybrominated dibenzofurans (PBDFs) and polybrominated biphenyls.(PBBs). Not all the congeners are considered toxic. Only 7 of 75 PCDDs (and PBCDs), 10 of 135 PCDFs (and PBDFs) and 11 of 209 PCBs (and PBBs) are considered toxic. The general 'rule' is that there must be *four or more* substitutions. Moreover, in the case of dioxins and furans, the *four substitutions must be in the 2,3,7,8 positions* and, in the case of biphenyls, only *one* substitution can occupy the 2, 6, 2' *or* 6' position. (The chlorinated dioxin-like compounds that are considered toxic, and their toxicity equivalency factors are shown in Table 3 of the report.)

The toxicity equivalents are computed by:

$$TEQ = \sum_{i=1}^{n} x_i \, TEF_i$$

where x_i is the concentration (or mass or mass emission rate) of dioxin-like compound i, and TEF_i is its toxicity equivalency factor, n is the number of dioxin-like compounds in the mixture, and TEQ is the 2,3,7,8-TCDD toxic equivalency of the mixture, in the same units as x_i.

Appendix 2 Model GPS1 PUF Sampler Calibration

1. Introduction
1.1. This standard operating procedure specifies the calibration requirements for Model GPS1 PUF sampler. The GPS1 PUF sampler should be calibrated:
1.1.1. Upon installation
1.1.2. After motor maintenance
1.1.3. At least once every three months
1.1.4. After 360 sampling hours

2. Apparatus and Materials
2.1. GPS1 sampling apparatus
2.2. G40A calibrator (orifice)
2.3. Manometer
2.4. GPS1 sampling module

3. Procedure
3.1. Calibration of the PUF sampler is performed without a foam plug or filter paper in the sampling module. However, the empty glass cartridge must remain in the module to ensure a good seal through the module.
3.2. Install the G40A Calibrator (orifice) on top of the GFH2104 four-inch filter holder. Tighten and make sure there are no leaks.
3.3. Open both ports on top of the manometer and connect tubing from manometer port to the pressure tap on the G40 Calibrator. Leave the opposite side of the manometer port open to the atmosphere.
3.4. Open ball valve fully (handle should be straight up; this is located inside of shelter directly above the blue blower motor).
3.5. Turn the system on by tripping the manual switch on the timer. Allow a few minutes for the motor to warm up.
3.6. Adjust and tighten the voltage control screw (variac) on the G991/ETI to obtain a reading of 70 inches on the dial of the Magnehelic gauge (or 80 inches, whichever is desired). Do not change until completion of calibration.
3.7. With 70 inches on the dial gage as your first calibration point, record this figure and the orifice manometer reading on your data sheet. When reading a manometer, one side goes up and one side goes down; adding both sides gives the reading in inches of water.
3.8. Close the ball valve slightly to re-adjust the dial gauge down to 60 inches. Record this figure and the orifice manometer reading on the data sheet.
3.9. Using the above procedure, adjust the ball valve for readings at 50, 40, and 30 inches and record on the data sheet. You should have five sets of numbers, 10 numbers in all.
3.10. Manually turn the sampler off.

4. Remarks
4.1. An example of a GPS1 PUF sampler calibration data sheet has been attached with data filled in from a typical calibration.

Appendix 3 Cleanup Protocol

1. Introduction

1.1. This standard operating procedure is for preparation of materials and reagents as well as cleanup of the extracts.

2. Reagents and Materials Preparation

2.1. Glassware

All reusable glassware must be scrupulously cleaned as soon as possible after use. Glassware is sequentially rinsed with the last solvent used, followed by hexane and acetone. This is followed by washing with a hot detergent solution and sequential rinsing with hot tap water, deionized water and three portions each of acetone, hexane and dichloromethane. Glassware is dried in an oven overnight at 225°C.

2.2. Glass Wool

Glass wool is compressed into a large glass column and washed sequentially with hexane and dichloromethane. Volume of solvent used for each wash should be twice the estimated volume of glass wool in the column. Loosely cover the mouth of the beaker and with hexane- and dichloromethane-rinsed aluminum foil; allow the glass wool to air dry in the fume hood and then condition overnight at 225°C in a vented oven. Store in large, wide-mouthed, Teflon-sealed bottle.

2.3. Sodium Sulphate

Granular, anhydrous sodium sulphate is washed in the same column used for glass wool preparation. Sequentially wash the sodium sulphate twice with hexane and twice with dichloromethane. The volume of solvent for each wash should be twice the estimated volume of sodium sulphate in the column. Transfer to a large beaker, cover loosely with solvent-rinsed aluminum foil, and oven dry at 50°C for at least one hour before conditioning overnight at 225°C. Store in a Teflon-sealed bottle in a desiccator.

2.4. Silica

Approximately 350 g of Bio-Sil (sufficient silica for 35 cleanup columns) is transferred to the glass column used for the glass wool and sodium sulphate preparation. Sequentially wash the silica twice with hexane and twice with dichloromethane. The volume of solvent for each wash should be twice the estimated volume of silica in the column. Transfer to a large beaker, cover loosely with solvent-rinsed aluminum foil, and oven dry at 50°C for at least one hour before conditioning at 225°C for at least four hours. Store in a Teflon-sealed bottle in a desiccator.

2.5. 44% Sulphuric Acid (H_2SO_4) on Silica

Add 78.6 g of concentrated H_2SO_4 in a stepwise manner (5 mL at a time) to 100 g of silica (prepared as described above) in a 500-mL glass-stoppered flask. After each addition, shake the flask vigorously until no clumps are observed. Store in the stoppered flask. This amount of material is enough for 40 cleanup columns. (**Caution:** This material has all the properties of concentrated H_2SO_4. Handle with care).

2.6. 33% 1 M Sodium Hydroxide (NaOH) on Silica

Add 24.6 g of a 1-M NaOH solution in a stepwise manner to 50 g of freshly conditioned silica in a glass-stoppered flask. After each addition, shake the flask until no lumps are observed. Store in a screw-capped bottle with a Teflon liner.

2.7. 10 % Silver Nitrate ($AgNO_3$) on Silica

Dissolve 5.6 g of silver nitrate in 21.5 mL of deionized water. This solution is added in a stepwise fashion to 50 g of freshly conditioned silica in a glass-stoppered flask. Between additions, the flask is shaken until a uniformly coated, free-flowing powder is produced. After the silver nitrate is added, allow the material to stand for approximately 30 minutes, cover the mouth of the flask with solvent rinsed aluminum foil, and place in an oven at 30°C. Over a 5-h period, gradually raise the oven temperature to 180°C and continue to condition overnight at this temperature. Cool to room temperature and immediately transfer to an amber glass, screw-capped bottle that has a Teflon liner. Minimize exposure of the material to light. Store in a desiccator until use.

2.8. Basic Alumina

Weigh two to three grams more alumina than is necessary (2.5 g/sample) for the number of samples to be batch-processed at one time. Add the alumina to a conditioning column and wash sequentially with dichloromethane and hexane (two portions each). The volume of solvent used for each wash should be two to three times the estimated volume of alumina in the column. After draining insert a glass wool plug into the column to immobilize the alumina. Drain as much solvent as possible from the wet alumina by suction on the valve end of the column, then place the column into a tube furnace. With the furnace off, purge the alumina with nitrogen at 200-400 mL per minute for approximately 30 minutes. While maintaining the nitrogen purge, condition the alumina at 350°C for a minimum of 2 h. Conditioned alumina must be used immediately after removal from the tube furnace. Do not store for later use. (**Caution:** Hot glass)

3. Cleanup Procedure

3.1 Acid/Base Silica Column

Plug the tip of the column with glass wool and add hexane to the column with enough volume to cover the reagents. Add the following in the order specified: 1.5 g of AgNO3/silica, (bottom layer), 1 g of silica, 2 g of 33% NaOH/silica, 1 g of silica, 4 g of 44% H2SO4/silica, 2 g of silica, and approximately 1 g of sodium sulphate to top off the column. Following the addition of each material, tap the column to ensure even layering.

Pre-wash the prepared column with 30 mL of 2% dichloromethane in hexane (v/v). Place a 250-mL boiling flask under each column. Via Pasteur pipette, transfer the concentrated raw extract onto the column, followed by three, 5-mL 2% dichloromethane/hexane (v/v) rinsings of the sample flask, also transferred using the same pipette.

When the third rinse has drained to the top of the sodium sulphate layer, pour an additional 50-mL of 2% dichloromethane/hexane (v/v) through the column. Concentrate the column effluent to a volume of approximately 2 mL by rotary evaporation at 38°C.

Add approximately 50 mL of hexane to the flask and repeat the concentration to exchange the solvent for hexane.

3.2 Alumina Column Chromatography

Plug the tip of the alumina column with glass wool add enough hexane to cover the alumina. Add 2.5 g of freshly prepared basic alumina. Top off with 0.5 cm of sodium sulphate. Add 15 mL hexane to pre-wash the column. When the hexane has been drained just to the top of the alumina bed, immediately place a 250-mL boiling flask labeled Fraction 1 under the column tip. Via Pasteur pipette, transfer the concentrated extract from the acid/base column into the alumina column, followed by three 5-mL rinsings of the sample flask, transferred using the same pipette.

Add 30 mL of hexane (2 x 15 mL) into the column after the flask rinsings have drained through. Allow the hexane in the column to drain just to the top of the alumina bed. Add 20 mL of freshly prepared 2% dichloromethane in hexane (v/v) to the column. This fraction (Fraction 1) is archived. When the solvent level in the column again just reaches the top of the alumina column, exchange the Fraction 1 flask for a 250-mL flask labeled Fraction 2. Add 30 mL of 50% dichloromethane/hexane (v/v) to the column and allow the column to drain completely. This fraction (Fraction 2) contains PCDD/PCDFs. Concentrate Fraction 1 to approximately 3 mL and Fraction 2 to approximately 1 mL by rotary evaporation at 38°C.

Via Pasteur pipette, transfer Fraction 1 (PCBs) to a pre-calibrated centrifuge tube and concentrate further under a gentle stream of pre-purified nitrogen. The dioxin fraction is transferred via Pasteur pipette to a pre-calibrated centrifuge tube and concentrated under a gentle stream of pre-purified nitrogen. Complete the sample transfer using the same pipette to make up three, 0.5-mL hexane rinses of the flask.

Transfer to a 200-µL conical vial and concentrate just to dryness. Cap vial and send sample vial to lab for analysis.

Appendix 4 Analytical Results for PCDD/PCDF Sampling

Table A1 PCDD/PCDF Sample Analysis Report (1997)

Sample Site: Calgary
Sample Location: Queens Court Roof
Sample Address: Downtown
Sample No: CA 1118-01
Sample Volume: 343 m^3

PCDD/PCDF Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)	PCDD/PCDF Homologues	Concentration (fg/m^3)	Number of Analyte peaks
Dioxins					
2378-TCDD	ND		TCDD	ND	0
12378-PaCDD	ND		PaCDD	ND	0
123478-HxCDD	ND		HxCDD	73	1
123678-HxCDD	ND		HpCDD	ND	0
123789-HxCDD	ND		Total	73	1
1234678-HpCDD	231	2.31	Homologues		
OCDD	149	1.49			
Furans					
2378-TCDF	29	2.90	TCDD	27	1
12378-PaCDF	ND		PaCDD	ND	0
23478-PaCDF	ND		HxCDD	12	1
123478-HxCDF	ND		HpCDD	32	1
123678-HxCDF	ND		Total	71	3
234878-HxCDF	ND		Homologues		
123789-HxCDF	ND				
1234678-HpCDF	NDR (29)	0.29			
1234789-HpCDF	ND				
OCDF	NDR (85)	0.09			
	Total TEQ = 7.08				

PCDD/PCDF Surrogate	Recovery %
13C12-2378-TCDD	82
13C12-2378-TCDF	72
13C12-12378-PaCDD	86
13C12-12378-PaCDF	71
13C12-23478-PaCDF	71
13C12-123478-HxCDD	101
13C12-123678-HxCDD	72
13C12-123478-HxCDF	85
13C12-123678-HxCDF	72
13C12-234678-HxCDF	78
13C12-123789-HxCDF	68
13C12-1234678-HpCDD	96
13C12-1234678-HpCDF	75
13C12-1234789-HpCDF	84
13C12-OCDD	104

Results corrected for surrogate recovery; ND = Not Detected; TEQ = Toxicity equivalents;
NDR = Not Detected, Incorrect Isotope Ratio

Table A2 PCDD/PCDF Sample Analysis Report (1997)

Sample Site: Calgary
Sample Location: AENV Site
Sample Address: Industrial
Sample No: CA 1118-02
Sample Volume: 336 m^3

PCDD/PCDF Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)	PCDD/PCDF Homologues	Concentration (fg/m^3)	Number of Analyte peaks
Dioxins					
2378-TCDD	ND		TCDD	ND	0
12378-PaCDD	ND		PaCDD	ND	0
123478-HxCDD	ND		HxCDD	119	2
123678-HxCDD	ND		HpCDD	176	1
123789-HxCDD	ND		Total	295	3
1234678-HpCDD	176	1.76	Homologues		
OCDD	1428	1.43			
Furans					
2378-TCDF	39	3.90	TCDD	ND	0
12378-PaCDF	ND		PaCDD	42	1
23478-PaCDF	ND		HxCDD	16	1
123478-HxCDF	NDR (30)	3.00	HpCDD	ND	0
123678-HxCDF	22		Total	58	2
234878-HxCDF	NDR (30)	3.00	Homologues		
123789-HxCDF	ND				
1234678-HpCDF	NDR (68)	0.68			
1234789-HpCDF	ND				
OCDF	48	0.05			
	Total TEQ = 13.82				

PCDD/PCDF Surrogate	Recovery %
13C12-2378-TCDD	72
13C12-2378-TCDF	76
13C12-12378-PaCDD	66
13C12-12378-PaCDF	76
13C12-23478-PaCDF	71
13C12-123478-HxCDD	84
13C12-123678-HxCDD	68
13C12-123478-HxCDF	89
13C12-123678-HxCDF	81
13C12-234678-HxCDF	80
13C12-123789-HxCDF	66
13C12-1234678-HpCDD	88
13C12-1234678-HpCDF	80
13C12-1234789-HpCDF	68
13C12-OCDD	90

Results corrected for surrogate recovery; ND = Not Detected; TEQ = Toxicity equivalents;
NDR = Not Detected, Incorrect Isotope Ratio

Table A3 PCDD/PCDF Sample Analysis Report (1998)

Sample Site: Calgary
Sample Location: AENV Site
Sample Address: Industrial

Sample No: CA0730-01
Sample Volume: 323 m^3

PCDD\F Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)	PCDD\F Homologues	Concentration (fg/m^3)	Number of Analyte peaks
Dioxins					
2378-TCDD	ND		TCDD	ND	0
12378-PeCDD	ND		PeCDD	ND	0
123478-HxCDD	ND		HxCDD	34	1
123678-HxCDD	ND		HpCDD	133	1
123789-HxCDD	ND		Total	167	2
1234678-HpCDD	111	1.11	Homologues		
OCDD	557	0.56			
Furans			TCDF	ND	0
2378-TCDF	23	2.29	PeCDF	53	1
12378-PeCDF	ND		HxCDF	62	1
23478-PeCDF	ND		HpCDF	62	1
123478-HxCDF	ND		Total	176	3
123678-HxCDF	ND		Homologues		
234678-HxCDF	ND				
123789-HxCDF	ND				
1234678-HpCDF	59	0.59			
1234789-HpCDF	ND				
OCDF	84	0.08			
		Total TEQ= 4.63			

PCDD/PCDF Surrogate	Recovery %
13C12-2378-TCDD	83
13C12-2378-TCDF	83
13C12-12378-PeCDD	74
13C12-12378-PeCDF	61
13C12-23478-PeCDF	69
13C12-123478-HxCDD	95
13C12-123678-HxCDD	97
13C12-123478-HxCDF	85
13C12-123678-HxCDF	86
13C12-234678-HxCDF	92
13C12-123789-HxCDF	85
13C12-1234678-HpCDD	95
13C12-1234678-HpCDF	79
13C12-1234789-HpCDF	91
13C12-OCDD	61

Results corrected for surrogate recovery; ND=Not Detected; TEQ=Toxicity equivalents;
NDR=Not Detected, Incorrect Isotope Ratio

Table A4 PCDD/PCDF Sample Analysis Report (1998)

Sample Site: Calgary **Sample No:** CA0730-02

Sample Location: Queens Court Roof **Sample Volume:** 305 m^3
Sample Address: Downtown

PCDD\F Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)	PCDD\F Homologues	Concentration (fg/m^3)	Number of Analyte peaks
Dioxins					
2378-TCDD	ND		TCDD	ND	0
12378-PeCDD	ND		PeCDD	ND	0
123478-HxCDD	ND		HxCDD	82	1
123678-HxCDD	27	2.69	HpCDD	223	1
123789-HxCDD	ND		Total	305	2
1234678-HpCDD	190	1.90	Homologues		
OCDD	NDR(525)	0.53			
Furans			TCDF	46	1
2378-TCDF	66	6.56	PeCDF	ND	0
12378-PeCDF	ND		HxCDF	52	1
23478-PeCDF	ND		HpCDF	ND	0
123478-HxCDF	ND		Total	98	2
123678-HxCDF	ND		Homologues		
234678-HxCDF	ND				
123789-HxCDF	ND				
1234678-HpCDF	52	0.52			
1234789-HpCDF	ND				
OCDF	ND				
		Total TEQ=	12.20		

PCDD/PCDF Surrogate	Recovery %
13C12-2378-TCDD	87
13C12-2378-TCDF	68
13C12-12378-PeCDD	83
13C12-12378-PeCDF	71
13C12-23478-PeCDF	82
13C12-123478-HxCDD	93
13C12-123678-HxCDD	96
13C12-123478-HxCDF	100
13C12-123678-HxCDF	93
13C12-234678-HxCDF	98
13C12-123789-HxCDF	96
13C12-1234678-HpCDD	106
13C12-1234678-HpCDF	91
13C12-1234789-HpCDF	100
13C12-OCDD	72

Results corrected for surrogate recovery; ND=Not Detected; TEQ=Toxicity equivalents;
NDR=Not Detected, Incorrect Isotope Ratio

Table A5 PCDD/PCDF Sample Analysis Report (1997)

Sample Site: Edmonton
Sample Location: Industrial
Sample Address: 17th Street

Sample No: ED 1125-01
Sample Volume: 342 m^3

PCDD/PCDF Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)	PCDD/PCDF Homologues	Concentration (fg/m^3)	Number of Analyte peaks
Dioxins					
2378-TCDD	ND		TCDD	29	1
12378-PaCDD	ND		PaCDD	ND	0
123478-HxCDD	15	1.50	HxCDD	138	2
123678-HxCDD	45	4.50	HpCDD	246	1
123789-HxCDD	NDR (45)	4.50	Total	413	4
1234678-HpCDD	272	2.72	Homologues		
OCDD	2199	2.19			
Furans					
2378-TCDF	82	8.20	TCDD	181	2
12378-PaCDF	35	1.75	PaCDD	322	6
23478-PaCDF	41	20.5	HxCDD	129	1
123478-HxCDF	164	16.4	HpCDD	ND	0
123678-HxCDF	NDR (61)	6.1	Total	632	9
234878-HxCDF	47	4.7	Homologues		
123789-HxCDF	ND				
1234678-HpCDF	410	4.10			
1234789-HpCDF	64	0.64			
OCDF	381	0.38			
	Total TEQ = 74.08				

PCDD/PCDF Surrogate	Recovery %
13C12-2378-TCDD	41
13C12-2378-TCDF	54
13C12-12378-PaCDD	69
13C12-12378-PaCDF	88
13C12-23478-PaCDF	63
13C12-123478-HxCDD	88
13C12-123678-HxCDD	65
13C12-123478-HxCDF	92
13C12-123678-HxCDF	80
13C12-234678-HxCDF	67
13C12-123789-HxCDF	63
13C12-1234678-HpCDD	84
13C12-1234678-HpCDF	77
13C12-1234789-HpCDF	89
13C12-OCDD	85

Results corrected for surrogate recovery; ND = Not Detected; TEQ = Toxicity equivalents;
NDR = Not Detected, Incorrect Isotope Ratio

Table A6 PCDD/PCDF Sample Analysis Report (1997)

Sample Site: Edmonton **Sample No:** ED-1125-02
Sample Location: Residential **Sample Volume:** 326 m^3
Sample Address: 127 St – 133 Ave.

PCDD/PCDF Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)	PCDD/PCDF Homologues	Concentration (fg/m^3)	Number of Analyte peaks
Dioxins					
2378-TCDD	ND		TCDD	ND	0
12378-PaCDD	ND		PaCDD	ND	0
123478-HxCDD	ND		HxCDD	86	1
123678-HxCDD	ND		HpCDD	338	1
123789-HxCDD	ND		Total	424	2
1234678-HpCDD	255	2.55	Homologues		
OCDD	2738	2.74			
Furans					
2378-TCDF	74	7.40	TCDD	212	2
12378-PaCDF	ND		PaCDD	ND	0
23478-PaCDF	ND	3.70	HxCDD	52	2
123478-HxCDF	37	2.40	HpCDD	ND	0
123678-HxCDF	NDR (24)	2.30	Total	264	4
234878-HxCDF	NDR (23)		Homologues		
123789-HxCDF	ND	1.17			
1234678-HpCDF	117				
1234789-HpCDF	ND				
OCDF	ND				
	Total TEQ = 22.26				

PCDD/PCDF Surrogate	Recovery %
13C12-2378-TCDD	28
13C12-2378-TCDF	33
13C12-12378-PaCDD	47
13C12-12378-PaCDF	44
13C12-23478-PaCDF	45
13C12-123478-HxCDD	69
13C12-123678-HxCDD	58
13C12-123478-HxCDF	80
13C12-123678-HxCDF	75
13C12-234678-HxCDF	54
13C12-123789-HxCDF	49
13C12-1234678-HpCDD	78
13C12-1234678-HpCDF	72
13C12-1234789-HpCDF	85
13C12-OCDD	74

Results corrected for surrogate recovery; ND = Not Detected; TEQ = Toxicity equivalents;
NDR = Not Detected, Incorrect Isotope Ratio

Table A7 PCDD/PCDF Sample Analysis Report (1998)

Sample Site: Edmonton **Sample No:** ED0915-01
Sample Location: Industrial **Sample Volume:** 334 m^3
Sample Address: 17th Street

PCDD\F Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)	PCDD\F Homologues	Concentration (fg/m^3)	Number of Analyte peaks
Dioxins					
2378-TCDD	ND		TCDD	ND	0
12378-PeCDD	ND		PeCDD	ND	0
123478-HxCDD	ND		HxCDD	ND	0
123678-HxCDD	ND		HpCDD	54	1
123789-HxCDD	ND		Total	54	1
1234678-HpCDD	57	0.57	Homologues		
OCDD	NDR(126)	0.13			
Furans			TCDF	ND	0
2378-TCDF	ND		PeCDF	ND	0
12378-PeCDF	ND		HxCDF	ND	0
23478-PeCDF	ND		HpCDF	ND	0
123478-HxCDF	ND		Total	ND	0
123678-HxCDF	ND		Homologues		
234678-HxCDF	ND				
123789-HxCDF	ND				
1234678-HpCDF	28	0.28			
1234789-HpCDF	ND				
OCDF	ND				
		Total TEQ=	0.98		

PCDD/PCDF Surrogate	Recovery %
13C12-2378-TCDD	102
13C12-2378-TCDF	95
13C12-12378-PeCDD	112
13C12-12378-PeCDF	78
13C12-23478-PeCDF	97
13C12-123478-HxCDD	88
13C12-123678-HxCDD	104
13C12-123478-HxCDF	90
13C12-123678-HxCDF	88
13C12-234678-HxCDF	92
13C12-123789-HxCDF	109
13C12-1234678-HpCDD	89
13C12-1234678-HpCDF	93
13C12-1234789-HpCDF	89
13C12-OCDD	74

Results corrected for surrogate recovery; ND=Not Detected; TEQ=Toxicity equivalents;
NDR=Not Detected, Incorrect Isotope Ratio

Table A8 PCDD/PCDF Sample Analysis Report (1998)

Sample Site: Edmonton **Sample No:** ED0915-02
Sample Location: Residential **Sample Volume:** 324 m^3
Sample Address: 127 St-133 Ave.

PCDD\F Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)	PCDD\F Homologues	Concentration (fg/m^3)	Number of Analyte peaks
Dioxins					
2378-TCDD	ND		TCDD	105	2
12378-PeCDD	34	16.98	PeCDD	170	1
123478-HxCDD	68	6.79	HxCDD	957	4
123678-HxCDD	68	6.79	HpCDD	679	1
123789-HxCDD	102	10.19	Total	1910	8
1234678-HpCDD	463	4.63	Homologues		
OCDD	741	0.13			
Furans			TCDF	201	4
2378-TCDF	198	19.75	PeCDF	117	1
12378-PeCDF	40	2.01	HxCDF	463	5
23478-PeCDF	68	33.95	HpCDF	133	2
123478-HxCDF	235	23.46	Total	914	12
123678-HxCDF	99	9.88	Homologues		
234678-HxCDF	160	16.05			
123789-HxCDF	ND				
1234678-HpCDF	370	3.70			
1234789-HpCDF	40	0.40			
OCDF	188	0.19			
		Total TEQ=	154.88		

PCDD/PCDF Surrogate	Recovery %
13C12-2378-TCDD	100
13C12-2378-TCDF	101
13C12-12378-PeCDD	94
13C12-12378-PeCDF	85
13C12-23478-PeCDF	92
13C12-123478-HxCDD	119
13C12-123678-HxCDD	124
13C12-123478-HxCDF	126
13C12-123678-HxCDF	127
13C12-234678-HxCDF	124
13C12-123789-HxCDF	106
13C12-1234678-HpCDD	122
13C12-1234678-HpCDF	126
13C12-1234789-HpCDF	110
13C12-OCDD	106

Results corrected for surrogate recovery; ND=Not Detected; TEQ=Toxicity equivalents;
NDR=Not Detected, Incorrect Isotope Ratio

Table A9 PCDD/PCDF Sample Analysis Report (1998)

Sample Site: Edmonton
Sample Location: Reimer
Sample Address: 160 St 128 Ave
Sample No: ED1021-01
Sample Volume: 373 m^3

PCDD\F Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)	PCDD\F Homologues	Concentration (fg/m^3)	Number of Analyte Peaks
Dioxins					
2378-TCDD	ND		TCDD	150	2
12378-PeCDD	ND		PeCDD	295	1
123478-HxCDD	54	5.36	HxCDD	1126	3
123678-HxCDD	NDR(56)	5.60	HpCDD	590	1
123789-HxCDD	70	6.97	Total	2161	7
1234678-HpCDD	483	4.83	Homologues		
OCDD	1635	1.64			
Furans			TCDF	139	2
2378-TCDF	263	26.27	PeCDF	697	4
12378-PeCDF	70	3.49	HxCDF	375	2
23478-PeCDF	97	48.26	HpCDF	233	2
123478-HxCDF	322	32.17	Total	1445	10
123678-HxCDF	86	8.58	Homologues		
234678-HxCDF	145	14.48			
123789-HxCDF	ND				
1234678-HpCDF	536	5.36			
1234789-HpCDF	43	0.43			
OCDF	228	0.23			
		Total TEQ=	163.66		

PCDD/PCDF Surrogate	Recovery %
13C12-2378-TCDD	108
13C12-2378-TCDF	97
13C12-12378-PeCDD	77
13C12-12378-PeCDF	64
13C12-23478-PeCDF	68
13C12-123478-HxCDD	62
13C12-123678-HxCDD	85
13C12-123478-HxCDF	64
13C12-123678-HxCDF	74
13C12-234678-HxCDF	77
13C12-123789-HxCDF	79
13C12-1234678-HpCDD	73
13C12-1234678-HpCDF	63
13C12-1234789-HpCDF	65
13C12-OCDD	60

Results corrected for surrogate recovery; ND=Not Detected; TEQ=Toxicity equivalents;
NDR=Not Detected, Incorrect Isotope Ratio

Table A10 PCDD/PCDF Sample Analysis Report (1998)

Sample Site: Edmonton **Sample No:** ED1021-02
Sample Location: Reimer **Sample Volume:** 357 m^3
Sample Address: 160 St 128 Ave

PCDD\F Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)	PCDD\F Homologues	Concentration (fg/m^3)	Number of Analyte peaks
Dioxins					
2378-TCDD	ND		TCDD	78	1
12378-PeCDD	ND		PeCDD	308	2
123478-HxCDD	ND		HxCDD	98	1
123678-HxCDD	ND		HpCDD	280	1
123789-HxCDD	ND		Total	765	5
1234678-HpCDD	213	2.13	Homologues		
OCDD	924	0.92			
Furans			TCDF	ND	0
2378-TCDF	129	12.89	PeCDF	364	3
12378-PeCDF	24	1.22	HxCDF	204	1
23478-PeCDF	48	23.81	HpCDF	ND	0
123478-HxCDF	143	14.29	Total	569	4
123678-HxCDF	36	3.64	Homologues		
234678-HxCDF	NDR(78)	7.80			
123789-HxCDF	ND				
1234678-HpCDF	NDR(308)	3.08			
1234789-HpCDF	ND				
OCDF	NDR(104)	0.10			
		Total TEQ=	69.88		

PCDD/PCDF Surrogate	Recovery %
13C12-2378-TCDD	69
13C12-2378-TCDF	54
13C12-12378-PeCDD	59
13C12-12378-PeCDF	51
13C12-23478-PeCDF	52
13C12-123478-HxCDD	82
13C12-123678-HxCDD	104
13C12-123478-HxCDF	85
13C12-123678-HxCDF	89
13C12-234678-HxCDF	82
13C12-123789-HxCDF	78
13C12-1234678-HpCDD	96
13C12-1234678-HpCDF	74
13C12-1234789-HpCDF	80
13C12-OCDD	82

Results corrected for surrogate recovery; ND=Not Detected; TEQ=Toxicity equivalents;
NDR=Not Detected, Incorrect Isotope Ratio

Table A11 PCDD/PCDF Sample Analysis Report (1998)

Sample Site: Exshaw **Sample No:** EX0731-01
Sample Location: Wild Life Lot **Sample Volume:** 313 m^3
Sample Address: Exshaw

PCDD\F Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)	PCDD\F Homologues	Concentration (fg/m^3)	Number of Analyte Peaks
Dioxins					
2378-TCDD	ND		TCDD	ND	0
12378-PeCDD	ND		PeCDD	ND	0
123478-HxCDD	ND		HxCDD	ND	0
123678-HxCDD	ND		HpCDD	ND	0
123789-HxCDD	ND		Total	ND	0
1234678-HpCDD	45	0.45	Homologues		
OCDD	109	0.11			
Furans			TCDF	ND	0
2378-TCDF	ND		PeCDF	ND	0
12378-PeCDF	ND		HxCDF	ND	0
23478-PeCDF	ND		HpCDF	ND	0
123478-HxCDF	ND		Total	ND	0
123678-HxCDF	ND		Homologues		
234678-HxCDF	ND				
123789-HxCDF	ND				
1234678-HpCDF	21	0.21			
1234789-HpCDF	ND				
OCDF	ND				
		Total TEQ=	0.76		

PCDD/PCDF Surrogate	Recovery %
13C12-2378-TCDD	68
13C12-2378-TCDF	63
13C12-12378-PeCDD	78
13C12-12378-PeCDF	72
13C12-23478-PeCDF	74
13C12-123478-HxCDD	80
13C12-123678-HxCDD	96
13C12-123478-HxCDF	84
13C12-123678-HxCDF	83
13C12-234678-HxCDF	84
13C12-123789-HxCDF	93
13C12-1234678-HpCDD	94
13C12-1234678-HpCDF	80
13C12-1234789-HpCDF	88
13C12-OCDD	72

Results corrected for surrogate recovery; ND=Not Detected; TEQ=Toxicity equivalents;
NDR=Not Detected, Incorrect Isotope Ratio

Table A12 PCDD/PCDF Sample Analysis Report (1998)

Sample Site: Exshaw **Sample No:** EX0731-02
Sample Location: Wild Life Lot **Sample Volume:** 317 m^3
Sample Address: Exshaw

PCDD\F Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)	PCDD\F Homologues	Concentration (fg/m^3)	Number of Analyte Peaks
Dioxins					
2378-TCDD	ND		TCDD	ND	0
12378-PeCDD	ND		PeCDD	ND	0
123478-HxCDD	ND		HxCDD	ND	0
123678-HxCDD	ND		HpCDD	41	1
123789-HxCDD	ND		Total	41	1
1234678-HpCDD	35	0.35	Homologues		
OCDD	66	0.07			
Furans			TCDF	ND	0
2378-TCDF	ND		PeCDF	ND	0
12378-PeCDF	ND		HxCDF	ND	0
23478-PeCDF	ND		HpCDF	ND	0
123478-HxCDF	ND		Total	ND	0
123678-HxCDF	ND		Homologues		
234678-HxCDF	ND				
123789-HxCDF	ND				
1234678-HpCDF	NDR(30)	0.30			
1234789-HpCDF	ND				
OCDF	47	0.05			
		Total TEQ=	0.76		

PCDD/PCDF Surrogate	Recovery %
13C12-2378-TCDD	81
13C12-2378-TCDF	99
13C12-12378-PeCDD	106
13C12-12378-PeCDF	104
13C12-23478-PeCDF	115
13C12-123478-HxCDD	83
13C12-123678-HxCDD	88
13C12-123478-HxCDF	91
13C12-123678-HxCDF	93
13C12-234678-HxCDF	92
13C12-123789-HxCDF	79
13C12-1234678-HpCDD	95
13C12-1234678-HpCDF	80
13C12-1234789-HpCDF	72
13C12-OCDD	71

Results corrected for surrogate recovery; ND=Not Detected; TEQ=Toxicity equivalents;
NDR=Not Detected, Incorrect Isotope Ratio

Table A13 PCDD/PCDF Sample Analysis Report (1997)

Sample Site: Fort McMurray
Sample Location: AENV site
Sample Address: Downtown
Sample No: FM 1028-01
Sample Volume: 407 m^3

PCDD/PCDF Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)	PCDD/PCDF Homologues	Concentration (fg/m^3)	Number of Analyte peaks
Dioxins					
2378-TCDD	ND		TCDD	ND	0
12378-PaCDD	ND		PaCDD	ND	0
123478-HxCDD	ND		HxCDD	ND	0
123678-HxCDD	ND		HpCDD	ND	0
123789-HxCDD	ND		Total	ND	0
1234678-HpCDD	NDR (64)	0.6	Homologues		
OCDD	294	0.3			
Furans					
2378-TCDF	ND		TCDD	ND	0
12378-PaCDF	ND		PaCDD	ND	0
23478-PaCDF	ND		HxCDD	ND	0
123478-HxCDF	ND		HpCDD	ND	0
123678-HxCDF	ND		Total	ND	0
234878-HxCDF	44		Homologues		
123789-HxCDF	ND	4.4			
1234678-HpCDF	61	0.6			
1234789-HpCDF	66	0.6			
OCDF	96	0.09			
	Total TEQ = 6.59				

PCDD/PCDF Surrogate	Recovery %
13C12-2378-TCDD	69
13C12-2378-TCDF	81
13C12-12378-PaCDD	77
13C12-12378-PaCDF	83
13C12-23478-PaCDF	70
13C12-123478-HxCDD	121
13C12-123678-HxCDD	92
13C12-123478-HxCDF	99
13C12-123678-HxCDF	90
13C12-234678-HxCDF	72
13C12-123789-HxCDF	83
13C12-1234678-HpCDD	117
13C12-1234678-HpCDF	92
13C12-1234789-HpCDF	97
13C12-OCDD	110

Results corrected for surrogate recovery; ND = Not Detected; TEQ = Toxicity equivalents;
NDR = Not Detected, Incorrect Isotope Ratio

Table A14 PCDD/PCDF Sample Analysis Report (1997)

Sample Site: Fort McMurray
Sample Location: Timberlea
Sample Address: Residential
Sample No: FM 1028-02
Sample Volume: 385 m^3

PCDD/PCDF Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)	PCDD/PCDF Homologues	Concentration (fg/m^3)	Number of Analyte Peaks
Dioxins					
2378-TCDD	ND		TCDD	ND	0
12378-PaCDD	ND		PaCDD	ND	0
123478-HxCDD	ND		HxCDD	ND	0
123678-HxCDD	ND		HpCDD	ND	0
123789-HxCDD	ND		Total	ND	0
1234678-HpCDD	ND		Homologues		
OCDD					
Furans					
2378-TCDF	ND		TCDD	ND	0
12378-PaCDF	ND		PaCDD	ND	0
23478-PaCDF	ND		HxCDD	ND	0
123478-HxCDF	ND		HpCDD	ND	0
123678-HxCDF	ND		Total	ND	0
234878-HxCDF	8	0.8	Homologues		
123789-HxCDF	ND				
1234678-HpCDF	ND				
1234789-HpCDF	ND				
OCDF	ND				
	Total TEQ = 0.8				

PCDD/PCDF Surrogate	Recovery %
13C12-2378-TCDD	74
13C12-2378-TCDF	61
13C12-12378-PaCDD	83
13C12-12378-PaCDF	72
13C12-23478-PaCDF	74
13C12-123478-HxCDD	92
13C12-123678-HxCDD	78
13C12-123478-HxCDF	88
13C12-123678-HxCDF	73
13C12-234678-HxCDF	80
13C12-123789-HxCDF	81
13C12-1234678-HpCDD	90
13C12-1234678-HpCDF	79
13C12-1234789-HpCDF	86
13C12-OCDD	89

Results corrected for surrogate recovery; ND = Not Detected; TEQ = Toxicity equivalents;
NDR = Not Detected, Incorrect Isotope Ratio

Table A15 PCDD/PCDF Sample Analysis Report (1997)

Sample Site: Fort Saskatchewan
Sample Location: Industrial
Sample Address: AENV Site

Sample No: FS 1126-01
Sample Volume: 358 m^3

PCDD/PCDF Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)	PCDD/PCDF Homologues	Concentration (fg/m^3)	Number of Analyte peaks
Dioxins					
2378-TCDD			TCDD		
12378-PaCDD	SAMPLE LOST		PaCDD		
123478-HxCDD	IN CLEANUP		HxCDD		
123678-HxCDD			HpCDD		
123789-HxCDD			Total		
1234678-HpCDD			Homologues		
OCDD					
Furans					
2378-TCDF			TCDD		
12378-PaCDF			PaCDD		
23478-PaCDF			HxCDD		
123478-HxCDF			HpCDD		
123678-HxCDF			Total		
234878-HxCDF			Homologues		
123789-HxCDF					
1234678-HpCDF					
1234789-HpCDF					
OCDF					
	Total TEQ =				

PCDD/PCDF Surrogate	Recovery %
13C12-2378-TCDD	
13C12-2378-TCDF	
13C12-12378-PaCDD	
13C12-12378-PaCDF	
13C12-23478-PaCDF	
13C12-123478-HxCDD	
13C12-123678-HxCDD	
13C12-123478-HxCDF	
13C12-123678-HxCDF	
13C12-234678-HxCDF	
13C12-123789-HxCDF	
13C12-1234678-HpCDD	
13C12-1234678-HpCDF	
13C12-1234789-HpCDF	
13C12-OCDD	

Results corrected for surrogate recovery; ND = Not Detected; TEQ = Toxicity equivalents;
NDR = Not Detected, Incorrect Isotope Ratio

Table A16 PCDD/PCDF Sample Analysis Report (1997)

Sample Site: Fort Saskatchewan
Sample Location: City Hall Roof
Sample Address: Downtown
Sample No: FS 1126-02
Sample Volume: 384 m^3

PCDD/PCDF Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)	PCDD/PCDF Homologues	Concentration (fg/m^3)	Number of Analyte peaks
Dioxins					
2378-TCDD	ND		TCDD	416	2
12378-PaCDD	ND		PaCDD	ND	0
123478-HxCDD	NDR (19)	1.90	HxCDD	731	3
123678-HxCDD	49	4.90	HpCDD	627	1
123789-HxCDD	62	6.20	Total	1774	6
1234678-HpCDD	548	5.48	Homologues		
OCDD	2167	2.17			
Furans					
2378-TCDF	107	10.70	TCDD	159	1
12378-PaCDF	ND		PaCDD	86	1
23478-PaCDF	ND		HxCDD	86	1
123478-HxCDF	91	9.10	HpCDD	ND	0
123678-HxCDF	47	4.70	Total	331	3
234878-HxCDF	34	3.40	Homologues		
123789-HxCDF	ND				
1234678-HpCDF	133	1.33			
1234789-HpCDF	ND				
OCDF	65	0.07			
	Total TEQ = 49.95				

PCDD/PCDF Surrogate	Recovery %
13C12-2378-TCDD	57
13C12-2378-TCDF	59
13C12-12378-PaCDD	56
13C12-12378-PaCDF	59
13C12-23478-PaCDF	54
13C12-123478-HxCDD	102
13C12-123678-HxCDD	84
13C12-123478-HxCDF	87
13C12-123678-HxCDF	99
13C12-234678-HxCDF	71
13C12-123789-HxCDF	55
13C12-1234678-HpCDD	76
13C12-1234678-HpCDF	82
13C12-1234789-HpCDF	75
13C12-OCDD	60

Results corrected for surrogate recovery; ND = Not Detected; TEQ = Toxicity equivalents;
NDR = Not Detected, Incorrect Isotope Ratio

Table A17 PCDD/PCDF Sample Analysis Report (1998)

Sample Site: Fort Saskatchewan
Sample Location: Industrial
Sample Address: AENV Site
Sample No: FS1006-01
Sample Volume: 341 m^3

PCDD\F Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)	PCDD\F Homologues	Concentration (fg/m^3)	Number of Analyte peaks
Dioxins					
2378-TCDD	ND		TCDD	ND	0
12378-PeCDD	ND		PeCDD	ND	0
123478-HxCDD	ND		HxCDD	ND	0
123678-HxCDD	ND		HpCDD	ND	0
123789-HxCDD	ND		Total	ND	0
1234678-HpCDD	62	0.62	Homologues		
OCDD	132	0.13			
Furans			TCDF	ND	0
2378-TCDF	ND		PeCDF	ND	0
12378-PeCDF	ND		HxCDF	ND	0
23478-PeCDF	ND		HpCDF	ND	0
123478-HxCDF	ND		Total	ND	0
123678-HxCDF	ND		Homologues		
234678-HxCDF	ND				
123789-HxCDF	ND				
1234678-HpCDF	ND				
1234789-HpCDF	ND				
OCDF	ND				
		Total TEQ= 0.75			

PCDD/PCDF Surrogate	Recovery %
13C12-2378-TCDD	44
13C12-2378-TCDF	33
13C12-12378-PeCDD	66
13C12-12378-PeCDF	55
13C12-23478-PeCDF	58
13C12-123478-HxCDD	112
13C12-123678-HxCDD	96
13C12-123478-HxCDF	83
13C12-123678-HxCDF	91
13C12-234678-HxCDF	90
13C12-123789-HxCDF	90
13C12-1234678-HpCDD	86
13C12-1234678-HpCDF	87
13C12-1234789-HpCDF	97
13C12-OCDD	73

Results corrected for surrogate recovery; ND=Not Detected; TEQ=Toxicity equivalents;
NDR=Not Detected, Incorrect Isotope Ratio

TableA18 PCDD/PCDF Sample Analysis Report (1998)

Sample Site: Fort Saskatchewan **Sample No:** FS1006-02
Sample Location: Industrial **Sample Volume:** 374 m^3
Sample Address: AENV Site

PCDD\F Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)	PCDD\F Homologues	Concentration (fg/m^3)	Number of Analyte peaks
Dioxins					
2378-TCDD	ND		TCDD	ND	0
12378-PeCDD	ND		PeCDD	ND	0
123478-HxCDD	ND		HxCDD	29	1
123678-HxCDD	ND		HpCDD	198	1
123789-HxCDD	ND		Total	227	2
1234678-HpCDD	179	1.79	Homologues		
OCDD	NDR(187)	0.19			
Furans			TCDF	ND	0
2378-TCDF	NDR(62)	6.20	PeCDF	ND	0
12378-PeCDF	ND		HxCDF	ND	0
23478-PeCDF	ND		HpCDF	ND	0
123478-HxCDF	ND		Total	ND	0
123678-HxCDF	ND		Homologues		
234678-HxCDF	ND				
123789-HxCDF	ND				
1234678-HpCDF	45	0.45			
1234789-HpCDF	ND				
OCDF	ND				
		Total TEQ=	8.63		

PCDD/PCDF Surrogate	Recovery %
13C12-2378-TCDD	65
13C12-2378-TCDF	50
13C12-12378-PeCDD	75
13C12-12378-PeCDF	58
13C12-23478-PeCDF	63
13C12-123478-HxCDD	96
13C12-123678-HxCDD	95
13C12-123478-HxCDF	94
13C12-123678-HxCDF	90
13C12-234678-HxCDF	103
13C12-123789-HxCDF	99
13C12-1234678-HpCDD	86
13C12-1234678-HpCDF	97
13C12-1234789-HpCDF	106
13C12-OCDD	76

Results corrected for surrogate recovery; ND=Not Detected; TEQ=Toxicity equivalents;
NDR=Not Detected, Incorrect Isotope Ratio

Table A19 PCDD/PCDF Sample Analysis Report (1997)

Sample Site: Joffre
Sample Location: Downtown (1)
Sample Address: Residential
Sample No: JO 1119-01
Sample Volume: 366 m^3

PCDD/PCDF Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)	PCDD/PCDF Homologues	Concentration (fg/m^3)	Number of Analyte peaks
Dioxins					
2378-TCDD	ND		TCDD	ND	0
12378-PaCDD	ND		PaCDD	ND	0
123478-HxCDD	ND		HxCDD	112	1
123678-HxCDD	ND		HpCDD	273	1
123789-HxCDD	ND		Total	385	2
1234678-HpCDD	273	2.73	Homologues		
OCDD	1339	1.34			
Furans					
2378-TCDF	14	1.4	TCDD	ND	0
12378-PaCDF	ND		PaCDD	ND	0
23478-PaCDF	ND		HxCDD	ND	0
123478-HxCDF	ND		HpCDD	ND	0
123678-HxCDF	ND		Total	ND	0
234878-HxCDF	ND		Homologues		
123789-HxCDF	ND				
1234678-HpCDF	ND				
1234789-HpCDF	ND				
OCDF	NDR (23)	0.02			
	Total TEQ = 5.49				

PCDD/PCDF Surrogate	Recovery %
13C12-2378-TCDD	94
13C12-2378-TCDF	85
13C12-12378-PaCDD	86
13C12-12378-PaCDF	84
13C12-23478-PaCDF	77
13C12-123478-HxCDD	98
13C12-123678-HxCDD	77
13C12-123478-HxCDF	92
13C12-123678-HxCDF	81
13C12-234678-HxCDF	84
13C12-123789-HxCDF	80
13C12-1234678-HpCDD	104
13C12-1234678-HpCDF	82
13C12-1234789-HpCDF	85
13C12-OCDD	119

Results corrected for surrogate recovery; ND = Not Detected; TEQ = Toxicity equivalents;
NDR = Not Detected, Incorrect Isotope Ratio

Table A20 PCDD/PCDF Sample Analysis Report (1997)

Sample Site: Joffre
Sample Location: Downtown (2)
Sample Address: Residential
Sample No: JO 1119-02
Sample Volume: 347 m^3

PCDD/PCDF Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)	PCDD/PCDF Homologues	Concentration (fg/m^3)	Number of Analyte peaks
Dioxins					
2378-TCDD	ND		TCDD	ND	0
12378-PaCDD	ND		PaCDD	ND	0
123478-HxCDD	ND		HxCDD	116	1
123678-HxCDD	ND		HpCDD	ND	0
123789-HxCDD	ND		Total	116	1
1234678-HpCDD	250	2.5	Homologues		
OCDD	693	0.69			
Furans					
2378-TCDF	ND		TCDD	ND	0
12378-PaCDF	ND		PaCDD	35	1
23478-PaCDF	ND		HxCDD	ND	0
123478-HxCDF	ND		HpCDD	ND	0
123678-HxCDF	ND		Total	35	1
234878-HxCDF	ND		Homologues		
123789-HxCDF	ND				
1234678-HpCDF	ND				
1234789-HpCDF	ND				
OCDF	ND				
	Total TEQ = 3.19				

PCDD/PCDF Surrogate	Recovery %
13C12-2378-TCDD	22
13C12-2378-TCDF	24
13C12-12378-PaCDD	44
13C12-12378-PaCDF	49
13C12-23478-PaCDF	38
13C12-123478-HxCDD	48
13C12-123678-HxCDD	46
13C12-123478-HxCDF	52
13C12-123678-HxCDF	50
13C12-234678-HxCDF	37
13C12-123789-HxCDF	32
13C12-1234678-HpCDD	45
13C12-1234678-HpCDF	51
13C12-1234789-HpCDF	41
13C12-OCDD	34

Results corrected for surrogate recovery; ND = Not Detected; TEQ = Toxicity equivalents;
NDR = Not Detected, Incorrect Isotope Ratio

Table A21 PCDD/PCDF Sample Analysis Report (1997)

Sample Site: Swan Hills
Sample Location: Hospital Roof
Sample Address: Hospital
Sample No: SH1104-01
Sample Volume: 352 m^3

PCDD/PCDF Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)	PCDD/PCDF Homologues	Concentration (fg/m^3)	Number of Analyte peaks
Dioxins					
2378-TCDD	ND		TCDD	ND	0
12378-PaCDD	ND		PaCDD	ND	0
123478-HxCDD	ND		HxCDD	ND	0
123678-HxCDD	ND		HpCDD	ND	0
123789-HxCDD	ND		Total	ND	0
1234678-HpCDD	34	0.340	Homologues		
OCDD	219	0.219			
Furans					
2378-TCDF	ND		TCDD	ND	0
12378-PaCDF	ND		PaCDD	ND	0
23478-PaCDF	ND		HxCDD	ND	0
123478-HxCDF	ND		HpCDD	ND	0
123678-HxCDF	ND		Total	ND	0
234878-HxCDF	ND		Homologues		
123789-HxCDF	ND				
1234678-HpCDF	ND				
1234789-HpCDF	ND				
OCDF	ND				
	Total TEQ = 0.559				

PCDD/PCDF Surrogate	Recovery %
13C12-2378-TCDD	72
13C12-2378-TCDF	62
13C12-12378-PaCDD	57
13C12-12378-PaCDF	59
13C12-23478-PaCDF	56
13C12-123478-HxCDD	84
13C12-123678-HxCDD	59
13C12-123478-HxCDF	78
13C12-123678-HxCDF	64
13C12-234678-HxCDF	74
13C12-123789-HxCDF	66
13C12-1234678-HpCDD	86
13C12-1234678-HpCDF	64
13C12-1234789-HpCDF	73
13C12-OCDD	100

Results corrected for surrogate recovery; ND = Not Detected; TEQ = Toxicity equivalents;
NDR = Not Detected, Incorrect Isotope Ratio

Table A22 PCDD/PCDF Sample Analysis Report (1997)

Sample Site: Swan Hills
Sample Location: Town Hall Parking Lot
Sample Address: Residential
Sample No: SH1104-02
Sample Volume: 333 m^3

PCDD/PCDF Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)	PCDD/PCDF Homologues	Concentration (fg/m^3)	Number of Analyte peaks
Dioxins					
2378-TCDD	ND		TCDD	ND	0
12378-PaCDD	ND		PaCDD	ND	0
123478-HxCDD	ND		HxCDD	ND	0
123678-HxCDD	ND		HpCDD	30	1
123789-HxCDD	ND		Total	30	1
1234678-HpCDD	29	0.29	Homologues		
OCDD	300	0.30			
Furans					
2378-TCDF	ND		TCDD	ND	0
12378-PaCDF	ND		PaCDD	ND	0
23478-PaCDF	ND		HxCDD	ND	0
123478-HxCDF	ND		HpCDD	ND	0
123678-HxCDF	ND		Total	ND	0
234878-HxCDF	NDR (7)	0.70	Homologues		
123789-HxCDF	ND				
1234678-HpCDF	ND				
1234789-HpCDF	ND				
OCDF	ND				
	Total TEQ = 1.29				

PCDD/PCDF Surrogate	Recovery %
13C12-2378-TCDD	87
13C12-2378-TCDF	78
13C12-12378-PaCDD	87
13C12-12378-PaCDF	77
13C12-23478-PaCDF	76
13C12-123478-HxCDD	106
13C12-123678-HxCDD	72
13C12-123478-HxCDF	91
13C12-123678-HxCDF	79
13C12-234678-HxCDF	88
13C12-123789-HxCDF	80
13C12-1234678-HpCDD	100
13C12-1234678-HpCDF	81
13C12-1234789-HpCDF	86
13C12-OCDD	109

Results corrected for surrogate recovery; ND = Not Detected; TEQ = Toxicity equivalents;
NDR = Not Detected, Incorrect Isotope Ratio

TableA23 PCDD/PCDF Sample Analysis Report (1998)

Sample Site: Swan Hills
Sample Location: Bovar
Sample Address: Weather Station
Sample No: SH0909-01
Sample Volume: 329 m^3

PCDD\F Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)	PCDD\F Homologues	Concentration (fg/m^3)	Number of Analyte peaks
Dioxins					
2378-TCDD	ND		TCDD	ND	0
12378-PeCDD	ND		PeCDD	ND	0
123478-HxCDD	ND		HxCDD	29	1
123678-HxCDD	ND		HpCDD	125	1
123789-HxCDD	ND		Total	154	2
1234678-HpCDD	125	1.25	Homologues		
OCDD	365	0.36			
Furans			TCDF	ND	0
2378-TCDF	NDR(46)	4.60	PeCDF	82	1
12378-PeCDF	ND		HxCDF	143	1
23478-PeCDF	30.4	15.20	HpCDF	ND	0
123478-HxCDF	121.6	12.16	Total	225	2
123678-HxCDF	48.6	4.86	Homologues		
234678-HxCDF	76.0	7.60			
123789-HxCDF	ND				
1234678-HpCDF	304.0	3.04			
1234789-HpCDF	ND				
OCDF	395.1	0.40			
		Total TEQ=	49.46		

PCDD/PCDF Surrogate	Recovery %
13C12-2378-TCDD	136
13C12-2378-TCDF	121
13C12-12378-PeCDD	106
13C12-12378-PeCDF	77
13C12-23478-PeCDF	90
13C12-123478-HxCDD	101
13C12-123678-HxCDD	98
13C12-123478-HxCDF	78
13C12-123678-HxCDF	74
13C12-234678-HxCDF	81
13C12-123789-HxCDF	83
13C12-1234678-HpCDD	86
13C12-1234678-HpCDF	91
13C12-1234789-HpCDF	89
13C12-OCDD	58

Results corrected for surrogate recovery; ND=Not Detected; TEQ=Toxicity equivalents;
NDR=Not Detected, Incorrect Isotope Ratio

Table A24 PCDD/PCDF Sample Analysis Report (1998)

Sample Site: Swan Hills **Sample No:** SH0909-02
Sample Location: Bovar **Sample Volume:** 355 m^3
Sample Address: Weather Station

PCDD\F Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)	PCDD\F Homologues	Concentration (fg/m^3)	Number of Analyte peaks
Dioxins					
2378-TCDD	ND		TCDD	ND	0
12378-PeCDD	ND		PeCDD	ND	0
123478-HxCDD	ND		HxCDD	172	1
123678-HxCDD	73	7.32	HpCDD	479	1
123789-HxCDD	79	7.89	Total	651	2
1234678-HpCDD	535	5.35	Homologues		
OCDD	873	0.87			
Furans			TCDF	394	3
2378-TCDF	310	30.99	PeCDF	451	1
12378-PeCDF	206	10.28	HxCDF	ND	0
23478-PeCDF	262	130.99	HpCDF	1634	2
123478-HxCDF	1155	115.49	Total	2479	6
123678-HxCDF	451	45.07	Homologues		
234678-HxCDF	620	61.97			
123789-HxCDF	ND				
1234678-HpCDF	2817	28.17			
1234789-HpCDF	479	4.79			
OCDF	2817	2.82			
		Total TEQ=	452.00		

PCDD/PCDF Surrogate	Recovery %
13C12-2378-TCDD	90
13C12-2378-TCDF	79
13C12-12378-PeCDD	77
13C12-12378-PeCDF	57
13C12-23478-PeCDF	62
13C12-123478-HxCDD	100
13C12-123678-HxCDD	99
13C12-123478-HxCDF	90
13C12-123678-HxCDF	83
13C12-234678-HxCDF	93
13C12-123789-HxCDF	82
13C12-1234678-HpCDD	95
13C12-1234678-HpCDF	102
13C12-1234789-HpCDF	117
13C12-OCDD	83

Results corrected for surrogate recovery; ND=Not Detected; TEQ=Toxicity equivalents;
NDR=Not Detected, Incorrect Isotope Ratio

Table A25 PCDD/PCDF Sample Analysis Report (1997)

Sample Site: Vegreville
Sample Location: ARC
Sample Address: North Side
Sample No: FM 1203-01
Sample Volume: 352 m^3

PCDD/PCDF Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)	PCDD/PCDF Homologues	Concentration (fg/m^3)	Number of Analyte peaks
Dioxins					
2378-TCDD	ND		TCDD	ND	0
12378-PaCDD	ND		PaCDD	ND	0
123478-HxCDD	ND		HxCDD	ND	0
123678-HxCDD	ND		HpCDD	ND	0
123789-HxCDD	ND		Total	ND	0
1234678-HpCDD	240	0.240	Homologues		
OCDD	596	0.60			
Furans					
2378-TCDF	ND		TCDD	ND	0
12378-PaCDF	ND		PaCDD	ND	0
23478-PaCDF	ND		HxCDD	ND	0
123478-HxCDF	ND		HpCDD	ND	0
123678-HxCDF	ND		Total	ND	0
234878-HxCDF	ND		Homologues		
123789-HxCDF	ND				
1234678-HpCDF	ND				
1234789-HpCDF	ND				
OCDF	ND				
	Total TEQ = 3.00				

PCDD/PCDF Surrogate	Recovery %
13C12-2378-TCDD	82
13C12-2378-TCDF	80
13C12-12378-PaCDD	73
13C12-12378-PaCDF	78
13C12-23478-PaCDF	75
13C12-123478-HxCDD	52
13C12-123678-HxCDD	63
13C12-123478-HxCDF	75
13C12-123678-HxCDF	61
13C12-234678-HxCDF	63
13C12-123789-HxCDF	67
13C12-1234678-HpCDD	88
13C12-1234678-HpCDF	72
13C12-1234789-HpCDF	82
13C12-OCDD	93

Results corrected for surrogate recovery; ND = Not Detected; TEQ = Toxicity equivalents;
NDR = Not Detected, Incorrect Isotope Ratio

Table A26 PCDD/PCDF Sample Analysis Report (1997)

Sample Site: Vegreville
Sample Location: ARC
Sample Address: South Side

Sample No: VE 1203-02
Sample Volume: 332 m^3

PCDD/PCDF Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)	PCDD/PCDF Homologues	Concentration (fg/m^3)	Number of Analyte peaks
Dioxins					
2378-TCDD	ND		TCDD	ND	0
12378-PaCDD	ND		PaCDD	ND	0
123478-HxCDD	ND		HxCDD	181	2
123678-HxCDD	ND		HpCDD	226	1
123789-HxCDD	ND		Total	407	3
1234678-HpCDD	214	2.14	Homologues		
OCDD	482	0.48			
Furans					
2378-TCDF	16	1.60	TCDD	ND	0
12378-PaCDF	ND		PaCDD	ND	0
23478-PaCDF	ND		HxCDD	ND	0
123478-HxCDF	ND		HpCDD	ND	0
123678-HxCDF	ND		Total	ND	0
234878-HxCDF	ND		Homologues		
123789-HxCDF	ND				
1234678-HpCDF	NDR (51)	0.51			
1234789-HpCDF	ND				
OCDF	ND				
	Total TEQ = 4.73				

PCDD/PCDF Surrogate	Recovery %
13C12-2378-TCDD	68
13C12-2378-TCDF	62
13C12-12378-PaCDD	53
13C12-12378-PaCDF	54
13C12-23478-PaCDF	49
13C12-123478-HxCDD	106
13C12-123678-HxCDD	80
13C12-123478-HxCDF	98
13C12-123678-HxCDF	95
13C12-234678-HxCDF	88
13C12-123789-HxCDF	77
13C12-1234678-HpCDD	90
13C12-1234678-HpCDF	86
13C12-1234789-HpCDF	89
13C12-OCDD	72

Results corrected for surrogate recovery; ND = Not Detected; TEQ = Toxicity equivalents;
NDR = Not Detected, Incorrect Isotope Ratio

Table A27 PCDD/PCDF Sample Analysis Report (1997)

Sample Site: Wainwright
Sample Location: Hospital Roof
Sample Address: Hospital
Sample No: WT 1113-01
Sample Volume: 377 m^3

PCDD/PCDF Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)	PCDD/PCDF Homologues	Concentration (fg/m^3)	Number of Analyte peaks
Dioxins					
2378-TCDD	ND		TCDD	ND	0
12378-PaCDD	ND		PaCDD	ND	0
123478-HxCDD	ND		HxCDD	ND	0
123678-HxCDD	ND		HpCDD	48	1
123789-HxCDD	ND		Total	48	1
1234678-HpCDD	63	0.630	Homologues		
OCDD	611	0.610			
Furans					
2378-TCDF	ND		TCDD	ND	0
12378-PaCDF	ND		PaCDD	ND	0
23478-PaCDF	ND		HxCDD	ND	0
123478-HxCDF	ND		HpCDD	ND	0
123678-HxCDF	ND		Total	ND	0
234878-HxCDF	ND		Homologues		
123789-HxCDF	ND				
1234678-HpCDF	ND				
1234789-HpCDF	ND				
OCDF	ND				
	Total TEQ = 1.240				

PCDD/PCDF Surrogate	Recovery %
13C12-2378-TCDD	76
13C12-2378-TCDF	82
13C12-12378-PaCDD	63
13C12-12378-PaCDF	76
13C12-23478-PaCDF	71
13C12-123478-HxCDD	98
13C12-123678-HxCDD	92
13C12-123478-HxCDF	102
13C12-123678-HxCDF	99
13C12-234678-HxCDF	103
13C12-123789-HxCDF	92
13C12-1234678-HpCDD	103
13C12-1234678-HpCDF	91
13C12-1234789-HpCDF	103
13C12-OCDD	105

Results corrected for surrogate recovery; ND = Not Detected; TEQ = Toxicity equivalents;
NDR = Not Detected, Incorrect Isotope Ratio

Table A28 PCDD/PCDF Sample Analysis Report (1997)

Sample Site: Wainwright
Sample Location: RCMP Parking Lot
Sample Address: Downtown
Sample No: FM 1113-02
Sample Volume: 356 m^3

PCDD/PCDF Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)	PCDD/PCDF Homologues	Concentration (fg/m^3)	Number of Analyte peaks
Dioxins					
2378-TCDD	ND		TCDD	65	2
12378-PaCDD	ND		PaCDD	31	1
123478-HxCDD	ND		HxCDD	107	2
123678-HxCDD	ND		HpCDD	107	1
123789-HxCDD	ND		Total	310	6
1234678-HpCDD	104	1.04	Homologues		
OCDD	986	0.986			
Furans					
2378-TCDF	29	2.9	TCDD	ND	0
12378-PaCDF	ND		PaCDD	26	1
23478-PaCDF	ND		HxCDD	ND	0
123478-HxCDF	ND		HpCDD	ND	0
123678-HxCDF	ND		Total	26	1
234878-HxCDF	ND		Homologues		
123789-HxCDF	ND				
1234678-HpCDF	NDR (29)	0.29			
1234789-HpCDF	ND				
OCDF	NDR (25)	0.025			
	Total TEQ = 5.241				

PCDD/PCDF Surrogate	Recovery %
13C12-2378-TCDD	93
13C12-2378-TCDF	82
13C12-12378-PaCDD	96
13C12-12378-PaCDF	78
13C12-23478-PaCDF	78
13C12-123478-HxCDD	95
13C12-123678-HxCDD	79
13C12-123478-HxCDF	88
13C12-123678-HxCDF	75
13C12-234678-HxCDF	79
13C12-123789-HxCDF	83
13C12-1234678-HpCDD	95
13C12-1234678-HpCDF	79
13C12-1234789-HpCDF	89
13C12-OCDD	100

Results corrected for surrogate recovery; ND = Not Detected; TEQ = Toxicity equivalents;
NDR = Not Detected, Incorrect Isotope Ratio

Table A29 PCDD/PCDF Sample Analysis Report (1998)

Sample Site: Wainwright **Sample No:** WT0930-01
Sample Location: Waste Treatment Plant **Sample Volume:** 332 m^3
Sample Address: Wainwright

PCDD\F Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)	PCDD\F Homologues	Concentration (fg/m^3)	Number of Analyte peaks
Dioxins					
2378-TCDD	ND		TCDD	181	1
12378-PeCDD	90	45.18	PeCDD	1360	7
123478-HxCDD	96	9.64	HxCDD	2387	4
123678-HxCDD	166	16.57	HpCDD	1390	1
123789-HxCDD	392	39.16	Total	5317	13
1234678-HpCDD	964	9.64	Homologues		
OCDD	1988	1.99			
Furans			TCDF	755	5
2378-TCDF	422	42.17	PeCDF	816	2
12378-PeCDF	108	5.42	HxCDF	695	2
23478-PeCDF	220	109.94	HpCDF	142	1
123478-HxCDF	572	57.23	Total	2408	10
123678-HxCDF	232	6.10	Homologues		
234678-HxCDF	331	33.13			
123789-HxCDF	ND				
1234678-HpCDF	934	9.34			
1234789-HpCDF	NDR(60)	0.60			
OCDF	422	0.42			
		Total TEQ=	386.52		

PCDD/PCDF Surrogate	Recovery %
13C12-2378-TCDD	40
13C12-2378-TCDF	41
13C12-12378-PeCDD	30
13C12-12378-PeCDF	25
13C12-23478-PeCDF	25
13C12-123478-HxCDD	56
13C12-123678-HxCDD	51
13C12-123478-HxCDF	46
13C12-123678-HxCDF	47
13C12-234678-HxCDF	58
13C12-123789-HxCDF	44
13C12-1234678-HpCDD	52
13C12-1234678-HpCDF	46
13C12-1234789-HpCDF	44
13C12-OCDD	30

Results corrected for surrogate recovery; ND=Not Detected; TEQ=Toxicity equivalents;
NDR=Not Detected, Incorrect Isotope Ratio

Table A30 PCDD/PCDF Sample Analysis Report (1998)

Sample Site: Wainwright **Sample No:** WT0930-02
Sample Location: Waste Treatment Plant **Sample Volume:** 355 m^3
Sample Address: Wainwright

PCDD\F Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)	PCDD\F Homologues	Concentration (fg/m^3)	Number of Analyte peaks
Dioxins					
2378-TCDD	ND		TCDD	ND	0
12378-PeCDD	NDR(76)	38.00	PeCDD	507	3
123478-HxCDD	51	5.07	HxCDD	1183	3
123678-HxCDD	121	12.11	HpCDD	873	1
123789-HxCDD	132	13.24	Total	2563	7
1234678-HpCDD	423	4.23	Homologues		
OCDD	451	0.45			
Furans			TCDF	ND	0
2378-TCDF	NDR(56)	5.60	PeCDF	65	1
12378-PeCDF	NDR(22)	1.10	HxCDF	ND	0
23478-PeCDF	NDR(37)	18.50	HpCDF	ND	0
123478-HxCDF	70	7.04	Total	65	1
123678-HxCDF	31	3.10	Homologues		
234678-HxCDF	ND				
123789-HxCDF	ND				
1234678-HpCDF	135	1.35			
1234789-HpCDF	ND				
OCDF	124	0.12			
		Total TEQ=	109.92		

PCDD/PCDF Surrogate	Recovery %
13C12-2378-TCDD	62
13C12-2378-TCDF	58
13C12-12378-PeCDD	54
13C12-12378-PeCDF	56
13C12-23478-PeCDF	57
13C12-123478-HxCDD	109
13C12-123678-HxCDD	96
13C12-123478-HxCDF	96
13C12-123678-HxCDF	87
13C12-234678-HxCDF	99
13C12-123789-HxCDF	103
13C12-1234678-HpCDD	83
13C12-1234678-HpCDF	90
13C12-1234789-HpCDF	89
13C12-OCDD	58

Results corrected for surrogate recovery; ND=Not Detected; TEQ=Toxicity equivalents;
NDR=Not Detected, Incorrect Isotope Ratio

Table A31 PCDD/PCDF Sample Analysis Report (1997)

Sample Site: Fort McMurray
Sample Location: Blank sample
Sample Address: Blank sample

Sample No: FM 1028-BL
Sample Volume: m^3

PCDD/PCDF Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)	PCDD/PCDF Homologues	Concentration (fg/m^3)	Number of Analyte peaks
Dioxins					
2378-TCDD	ND		TCDD	ND	0
12378-PaCDD	ND		PaCDD	ND	0
123478-HxCDD	ND		HxCDD	ND	0
123678-HxCDD	ND		HpCDD	ND	0
123789-HxCDD	ND		Total Homologues	ND	0
1234678-HpCDD	ND				
OCDD	96	0.01			
Furans					
2378-TCDF	ND		TCDD	ND	0
12378-PaCDF	ND		PaCDD	ND	0
23478-PaCDF	ND		HxCDD	ND	0
123478-HxCDF	ND		HpCDD	ND	0
123678-HxCDF	ND		Total Homologues	ND	0
234878-HxCDF	ND				
123789-HxCDF	ND				
1234678-HpCDF	ND				
1234789-HpCDF	ND				
OCDF	ND				
	Total TEQ = 0.01				

PCDD/PCDF Surrogate	Recovery %
13C12-2378-TCDD	78
13C12-2378-TCDF	87
13C12-12378-PaCDD	83
13C12-12378-PaCDF	72
13C12-23478-PaCDF	69
13C12-123478-HxCDD	96
13C12-123678-HxCDD	71
13C12-123478-HxCDF	78
13C12-123678-HxCDF	73
13C12-234678-HxCDF	73
13C12-123789-HxCDF	75
13C12-1234678-HpCDD	79
13C12-1234678-HpCDF	73
13C12-1234789-HpCDF	73
13C12-OCDD	98

Results corrected for surrogate recovery; ND = Not Detected; TEQ = Toxicity equivalents;
NDR = Not Detected, Incorrect Isotope Ratio

Table A32 PCDD/PCDF Sample Analysis Report (1997)

Sample Site: Alberta Research Council **Sample No:** FM 1028-SP
Sample Location: Spike Sample **Sample Volume:** m^3
Sample Address:

PCDD/PCDF Congener	Concentration (pg)	TEQ (fg/m^3)	PCDD/PCDF Homologues	Concentration (fg/m^3)	Number of Analyte peaks
Dioxins					
2378-TCDD	16		TCDD	ND	0
12378-PaCDD	85		PaCDD	ND	0
123478-HxCDD	80		HxCDD	ND	0
123678-HxCDD	87		HpCDD	ND	0
123789-HxCDD	77		Total	ND	0
1234678-HpCDD	80		Homologues		
OCDD	240				
Furans					
2378-TCDF	19		TCDD	ND	0
12378-PaCDF	83		PaCDD	ND	0
23478-PaCDF	76		HxCDD	ND	0
123478-HxCDF	83		HpCDD	ND	0
123678-HxCDF	88		Total	ND	0
234878-HxCDF	83		Homologues		
123789-HxCDF	87				
1234678-HpCDF	87				
1234789-HpCDF	83				
OCDF	200				
	Total TEQ =				

PCDD/PCDF Surrogate	Recovery %
13C12-2378-TCDD	67
13C12-2378-TCDF	70
13C12-12378-PaCDD	65
13C12-12378-PaCDF	80
13C12-23478-PaCDF	63
13C12-123478-HxCDD	91
13C12-123678-HxCDD	85
13C12-123478-HxCDF	92
13C12-123678-HxCDF	83
13C12-234678-HxCDF	74
13C12-123789-HxCDF	90
13C12-1234678-HpCDD	96
13C12-1234678-HpCDF	85
13C12-1234789-HpCDF	93
13C12-OCDD	80

Results corrected for surrogate recovery; ND = Not Detected; TEQ = Toxicity equivalents;
NDR = Not Detected, Incorrect Isotope Ratio

Table A33 PCDD/PCDF Sample Analysis Report (1997)

Sample Site: Fort Saskatchewan
Sample Location: Blank Sample
Sample Address: Blank Sample
Sample No: FM 1126-BL
Sample Volume: m^3

PCDD/PCDF Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)	PCDD/PCDF Homologues	Concentration (fg/m^3)	Number of Analyte peaks
Dioxins					
2378-TCDD	ND		TCDD	ND	0
12378-PaCDD	ND		PaCDD	ND	0
123478-HxCDD	ND		HxCDD	ND	0
123678-HxCDD	ND		HpCDD	40	1
123789-HxCDD	ND		Total	40	1
1234678-HpCDD	40	0.40	Homologues		
OCDD	1837	1.80			
Furans					
2378-TCDF	ND		TCDD	ND	0
12378-PaCDF	ND		PaCDD	ND	0
23478-PaCDF	ND		HxCDD	ND	0
123478-HxCDF	ND		HpCDD	ND	0
123678-HxCDF	ND		Total	ND	0
234878-HxCDF	ND		Homologues		
123789-HxCDF	ND				
1234678-HpCDF	ND				
1234789-HpCDF	ND				
OCDF	ND				
	Total TEQ = 2.10				

PCDD/PCDF Surrogate	Recovery %
13C12-2378-TCDD	51
13C12-2378-TCDF	50
13C12-12378-PaCDD	59
13C12-12378-PaCDF	62
13C12-23478-PaCDF	60
13C12-123478-HxCDD	77
13C12-123678-HxCDD	72
13C12-123478-HxCDF	90
13C12-123678-HxCDF	75
13C12-234678-HxCDF	76
13C12-123789-HxCDF	62
13C12-1234678-HpCDD	69
13C12-1234678-HpCDF	71
13C12-1234789-HpCDF	61
13C12-OCDD	65

Results corrected for surrogate recovery; ND = Not Detected; TEQ = Toxicity equivalents;
NDR = Not Detected, Incorrect Isotope Ratio

Table A34 PCDD/PCDF Sample Analysis Report (1997)

Sample Site: Vegreville
Sample Location: Blank Sample
Sample Address: Blank Sample

Sample No: VE 1203-BL
Sample Volume: m^3

PCDD/PCDF Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)	PCDD/PCDF Homologues	Concentration (fg/m^3)	Number of Analyte peaks
Dioxins					
2378-TCDD	ND		TCDD	ND	0
12378-PaCDD	ND		PaCDD	ND	0
123478-HxCDD	ND		HxCDD	ND	0
123678-HxCDD	ND		HpCDD	ND	0
123789-HxCDD	ND		Total	ND	0
1234678-HpCDD	ND		Homologues		
OCDD	ND				
Furans					
2378-TCDF	ND		TCDD	ND	0
12378-PaCDF	ND		PaCDD	ND	0
23478-PaCDF	ND		HxCDD	ND	0
123478-HxCDF	ND		HpCDD	ND	0
123678-HxCDF	ND		Total	ND	0
234878-HxCDF	ND		Homologues		
123789-HxCDF	ND				
1234678-HpCDF	ND				
1234789-HpCDF	ND				
OCDF	ND				
	Total TEQ =				

PCDD/PCDF Surrogate	Recovery %
13C12-2378-TCDD	73
13C12-2378-TCDF	72
13C12-12378-PaCDD	70
13C12-12378-PaCDF	76
13C12-23478-PaCDF	74
13C12-123478-HxCDD	108
13C12-123678-HxCDD	97
13C12-123478-HxCDF	96
13C12-123678-HxCDF	93
13C12-234678-HxCDF	89
13C12-123789-HxCDF	70
13C12-1234678-HpCDD	99
13C12-1234678-HpCDF	90
13C12-1234789-HpCDF	84
13C12-OCDD	79

Results corrected for surrogate recovery; ND = Not Detected; TEQ = Toxicity equivalents;
NDR = Not Detected, Incorrect Isotope Ratio

Table A35 PCDD/PCDF Sample Analysis Report (1997)

Sample Site: Wainwright
Sample Location: Blank Sample
Sample Address: Blank Sample
Sample No: WT 1113-BL
Sample Volume: m^3

PCDD/PCDF Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)	PCDD/PCDF Homologues	Concentration (fg/m^3)	Number of Analyte peaks
Dioxins					
2378-TCDD	ND		TCDD	ND	0
12378-PaCDD	ND		PaCDD	ND	0
123478-HxCDD	ND		HxCDD	ND	0
123678-HxCDD	ND		HpCDD	ND	0
123789-HxCDD	ND		Total	ND	0
1234678-HpCDD	10	0.10	Homologues		
OCDD	610	0.61			
Furans					
2378-TCDF	ND		TCDD	ND	0
12378-PaCDF	ND		PaCDD	ND	0
23478-PaCDF	ND		HxCDD	ND	0
123478-HxCDF	ND		HpCDD	ND	0
123678-HxCDF	ND		Total	ND	0
234878-HxCDF	ND		Homologues		
123789-HxCDF	ND				
1234678-HpCDF	ND				
1234789-HpCDF	ND				
OCDF	ND				
	Total TEQ = 0.71				

PCDD/PCDF Surrogate	Recovery %
13C12-2378-TCDD	81
13C12-2378-TCDF	74
13C12-12378-PaCDD	78
13C12-12378-PaCDF	72
13C12-23478-PaCDF	73
13C12-123478-HxCDD	100
13C12-123678-HxCDD	85
13C12-123478-HxCDF	86
13C12-123678-HxCDF	77
13C12-234678-HxCDF	84
13C12-123789-HxCDF	88
13C12-1234678-HpCDD	99
13C12-1234678-HpCDF	84
13C12-1234789-HpCDF	102
13C12-OCDD	104

Results corrected for surrogate recovery; ND = Not Detected; TEQ = Toxicity equivalents;
NDR = Not Detected, Incorrect Isotope Ratio

Table A36 PCDD/PCDF Sample Analysis Report (1997)

Sample Site: Vegreville
Sample Location: Glassware Solvent Wash
Sample Address: Blank
Sample No: VE 1216-GB
Sample Volume: m^3

PCDD/PCDF Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)	PCDD/PCDF Homologues	Concentration (fg/m^3)	Number of Analyte peaks
Dioxins					
2378-TCDD	ND		TCDD	ND	0
12378-PaCDD	ND		PaCDD	ND	0
123478-HxCDD	ND		HxCDD	ND	0
123678-HxCDD	ND		HpCDD	ND	0
123789-HxCDD	ND		Total	ND	0
1234678-HpCDD	ND		Homologues		
OCDD	ND				
Furans					
2378-TCDF	ND		TCDD	ND	0
12378-PaCDF	ND		PaCDD	ND	0
23478-PaCDF	ND		HxCDD	ND	0
123478-HxCDF	ND		HpCDD	ND	0
123678-HxCDF	ND		Total	ND	0
234878-HxCDF	ND		Homologues		
123789-HxCDF	ND				
1234678-HpCDF	ND				
1234789-HpCDF	ND				
OCDF	ND				
	Total TEQ =				

PCDD/PCDF Surrogate	Recovery %
13C12-2378-TCDD	SURROGATE NOT ADDED
13C12-2378-TCDF	
13C12-12378-PaCDD	
13C12-12378-PaCDF	
13C12-23478-PaCDF	
13C12-123478-HxCDD	
13C12-123678-HxCDD	
13C12-123478-HxCDF	
13C12-123678-HxCDF	
13C12-234678-HxCDF	
13C12-123789-HxCDF	
13C12-1234678-HpCDD	
13C12-1234678-HpCDF	
13C12-1234789-HpCDF	
13C12-OCDD	

Results corrected for surrogate recovery; ND = Not Detected; TEQ = Toxicity equivalents;
NDR = Not Detected, Incorrect Isotope Ratio

Table A37 PCDD/PCDF Sample Analysis Report (1998)

Sample Site: Vegreville **Sample No:** VE0930-GB
Sample Location: Glassware Blank **Sample Volume:** m^3
Sample Address:

PCDD\F Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)	PCDD\F Homologues	Concentration (fg/m^3)	Number of Analyte peaks
Dioxins					
2378-TCDD	ND		TCDD	ND	0
12378-PeCDD	ND		PeCDD	ND	0
123478-HxCDD	ND		HxCDD	ND	0
123678-HxCDD	ND		HpCDD	ND	0
123789-HxCDD	ND		Total	ND	0
1234678-HpCDD	ND		Homologues		
OCDD	ND				
Furans			TCDF	ND	0
2378-TCDF	ND		PeCDF	ND	0
12378-PeCDF	ND		HxCDF	ND	0
23478-PeCDF	ND		HpCDF	ND	0
123478-HxCDF	ND		Total	ND	0
123678-HxCDF	ND		Homologues		
234678-HxCDF	ND				
123789-HxCDF	ND				
1234678-HpCDF	NDR(12)	0.12			
1234789-HpCDF	ND				
OCDF	ND				
		Total TEQ=	0.12		

PCDD/PCDF Surrogate	Recovery %
13C12-2378-TCDD	81
13C12-2378-TCDF	70
13C12-12378-PeCDD	82
13C12-12378-PeCDF	65
13C12-23478-PeCDF	71
13C12-123478-HxCDD	73
13C12-123678-HxCDD	103
13C12-123478-HxCDF	85
13C12-123678-HxCDF	84
13C12-234678-HxCDF	83
13C12-123789-HxCDF	98
13C12-1234678-HpCDD	86
13C12-1234678-HpCDF	86
13C12-1234789-HpCDF	99
13C12-OCDD	65

Results corrected for surrogate recovery; ND=Not Detected; TEQ=Toxicity equivalents;
NDR=Not Detected, Incorrect Isotope Ratio

Table A38 PCDD/PCDF Sample Analysis Report (1998)

Sample Site: Vegreville **Sample No:** VE0930-SP
Sample Location: Spike Sample **Sample Volume:** m^3
Sample Address:

PCDD\F Congener	Recovery (%)	TEQ (fg/m^3)	PCDD\F Homologues	Concentration (fg/m^3)
Dioxins				
2378-TCDD	85		TCDD	ND
12378-PeCDD	91		PeCDD	ND
123478-HxCDD	87		HxCDD	ND
123678-HxCDD	100		HpCDD	ND
123789-HxCDD	90		Total	ND
1234678-HpCDD	120		Homologues	
OCDD	105			
Furans			TCDF	ND
2378-TCDF	130		PeCDF	ND
12378-PeCDF	110		HxCDF	ND
23478-PeCDF	91		HpCDF	ND
123478-HxCDF	130		Total	ND
123678-HxCDF	120		Homologues	
234678-HxCDF	110			
123789-HxCDF	79			
1234678-HpCDF	90			
1234789-HpCDF	120			
OCDF	140			
		Total TEQ=		

PCDD/PCDF Surrogate	Recovery %
13C12-2378-TCDD	46
13C12-2378-TCDF	42
13C12-12378-PeCDD	57
13C12-12378-PeCDF	45
13C12-23478-PeCDF	51
13C12-123478-HxCDD	97
13C12-123678-HxCDD	108
13C12-123478-HxCDF	77
13C12-123678-HxCDF	84
13C12-234678-HxCDF	90
13C12-123789-HxCDF	86
13C12-1234678-HpCDD	79
13C12-1234678-HpCDF	78
13C12-1234789-HpCDF	85
13C12-OCDD	79

Results corrected for surrogate recovery; ND=Not Detected; TEQ=Toxicity equivalents;
NDR=Not Detected, Incorrect Isotope Ratio

Table A39 PCDD/PCDF Sample Analysis Report (1998)

Sample Site: Vegreville **Sample No:** VE1214-01
Sample Location: PUF Blank #1 **Sample Volume:** m^3
Sample Address:

PCDD\F Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)	PCDD\F Homologues	Concentration (fg/m^3)	Number of Analyte peaks
Dioxins					
2378-TCDD	ND		TCDD	ND	0
12378-PeCDD	ND		PeCDD	ND	0
123478-HxCDD	ND		HxCDD	ND	0
123678-HxCDD	ND		HpCDD	ND	0
123789-HxCDD	ND		Total	ND	0
1234678-HpCDD	ND		Homologues		
OCDD	63	0.06			
Furans			TCDF	ND	0
2378-TCDF	ND		PeCDF	ND	0
12378-PeCDF	ND		HxCDF	ND	0
23478-PeCDF	ND		HpCDF	ND	0
123478-HxCDF	ND		Total	ND	0
123678-HxCDF	ND		Homologues		
234678-HxCDF	ND				
123789-HxCDF	ND				
1234678-HpCDF	ND				
1234789-HpCDF	ND				
OCDF	ND				
		Total TEQ=	0.06		

PCDD/PCDF Surrogate	Recovery %
13C12-2378-TCDD	76
13C12-2378-TCDF	68
13C12-12378-PeCDD	89
13C12-12378-PeCDF	88
13C12-23478-PeCDF	107
13C12-123478-HxCDD	83
13C12-123678-HxCDD	89
13C12-123478-HxCDF	90
13C12-123678-HxCDF	96
13C12-234678-HxCDF	95
13C12-123789-HxCDF	95
13C12-1234678-HpCDD	89
13C12-1234678-HpCDF	80
13C12-1234789-HpCDF	86
13C12-OCDD	62

Results corrected for surrogate recovery; ND=Not Detected; TEQ=Toxicity equivalents;
NDR=Not Detected, Incorrect Isotope Ratio

Table A40 PCDD/PCDF Sample Analysis Report (1998)

Sample Site: Vegreville **Sample No:** VE1214-02
Sample Location: PUF Blank #2 **Sample Volume:** m^3
Sample Address:

PCDD\F Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)	PCDD\F Homologues	Concentration (fg/m^3)	Number of Analyte peaks
Dioxins					
2378-TCDD	ND		TCDD	ND	0
12378-PeCDD	ND		PeCDD	ND	0
123478-HxCDD	ND		HxCDD	ND	0
123678-HxCDD	ND		HpCDD	ND	0
123789-HxCDD	ND		Total	ND	0
1234678-HpCDD	ND		Homologues		
OCDD	NDR(43)	0.04			
Furans			TCDF	ND	0
2378-TCDF	ND		PeCDF	ND	0
12378-PeCDF	ND		HxCDF	ND	0
23478-PeCDF	ND		HpCDF	ND	0
123478-HxCDF	ND		Total	ND	0
123678-HxCDF	ND		Homologues		
234678-HxCDF	ND				
123789-HxCDF	ND				
1234678-HpCDF	22	0.22			
1234789-HpCDF	ND				
OCDF	28	0.03			
		Total TEQ=	0.29		

PCDD/PCDF Surrogate	Recovery %
13C12-2378-TCDD	82
13C12-2378-TCDF	89
13C12-12378-PeCDD	81
13C12-12378-PeCDF	74
13C12-23478-PeCDF	75
13C12-123478-HxCDD	78
13C12-123678-HxCDD	89
13C12-123478-HxCDF	85
13C12-123678-HxCDF	81
13C12-234678-HxCDF	85
13C12-123789-HxCDF	91
13C12-1234678-HpCDD	72
13C12-1234678-HpCDF	79
13C12-1234789-HpCDF	71
13C12-OCDD	59

Results corrected for surrogate recovery; ND=Not Detected; TEQ=Toxicity equivalents;
NDR=Not Detected, Incorrect Isotope Ratio

Appendix 5. Analytical Results for Dioxin-Like PCB Sampling

Table A41 Dioxin-Like PCBs Sample Analysis Report (1998)

Sample Site: Calgary **Sample No:** CA0730-01
Sample Location: AENV Site **Sample Volume:** 323 m^3
Sample Address: Industrial

Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)
PCB 77	214	0.02
PCB 81	ND	
PCB 105	1610	0.16
PCB 114	ND	
PCB 118	3096	0.31
PCB 123	232	0.02
PCB 126	ND	
PCB 156	433	0.22
PCB 157	ND	
PCB 167	743	0.01
PCB 169	ND	
PCB 189	ND	
	Total TEQ=0.74	
PCB Surrogate	**Recovery %**	
13C12-PCB 28	73	
13C12-PCB 52	72	
13C12-PCB 101	74	
13C12-PCB 138	67	
13C12-PCB 153	75	
13C12-PCB 180	85	
13C12-PCB 202	65	
13C12-PCB 208	69	
13C12-PCB 209	58	
13C12-PCB 77	74	
13C12-PCB 126	93	
13C12-PCB 169	101	

Results corrected for surrogate recovery; ND=Not Detected; TEQ=Toxicity equivalents; NDR=Not Detected, Incorrect Isotope Ratio

Table A42 Dioxin-Like PCBs Sample Analysis Report (1998)

Sample Site: Calgary **Sample No:** CA0730-02
Sample Location: Queens Court **Sample Volume:** 305 m^3
Sample Address: Downtown

Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)
PCB 77	75410	7.54
PCB 81	8525	0.85
PCB 105	236066	23.61
PCB 114	16721	8.36
PCB 118	590164	59.02
PCB 123	26885	2.69
PCB 126	1639	163.93
PCB 156	17049	8.52
PCB 157	2230	1.11
PCB 167	39344	0.39
PCB 169	ND	
PCB 189	NDR(525)	0.05
	Total TEQ=276.09	

PCB Surrogate	Recovery %
13C12-PCB 28	68
13C12-PCB 52	64
13C12-PCB 101	64
13C12-PCB 138	58
13C12-PCB 153	61
13C12-PCB 180	87
13C12-PCB 202	65
13C12-PCB 208	71
13C12-PCB 209	22
13C12-PCB 77	69
13C12-PCB 126	79
13C12-PCB 169	87

Results corrected for surrogate recovery; ND=Not Detected; TEQ=Toxicity equivalents; NDR=Not Detected, Incorrect Isotope Ratio

Table A43 Dioxin-Like PCBs Sample Analysis Report (1998)

Sample Site:	Edmonton	**Sample No:**	ED0915-01
Sample Location:	Industrial	**Sample Volume:**	334 m^3
Sample Address:	17th Street		

Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)
PCB 77	359	0.04
PCB 81	ND	
PCB 105	1078	0.11
PCB 114	84	0.04
PCB 118	2605	0.26
PCB 123	NDR(93)	0.01
PCB 126	ND	
PCB 156	93	0.05
PCB 157	ND	
PCB 167	359	0.004
PCB 169	ND	
PCB 189	ND	
	Total TEQ=0.51	
PCB Surrogate	**Recovery %**	
13C12-PCB 28	74	
13C12-PCB 52	79	
13C12-PCB 101	67	
13C12-PCB 138	91	
13C12-PCB 153	88	
13C12-PCB 180	64	
13C12-PCB 202	56	
13C12-PCB 208	99	
13C12-PCB 209	108	
13C12-PCB 77	77	
13C12-PCB 126	91	
13C12-PCB 169	96	

Results corrected for surrogate recovery; ND=Not Detected; TEQ=Toxicity equivalents;
NDR=Not Detected, Incorrect Isotope Ratio

Table A44 Dioxin-Like PCBs Sample Analysis Report (1998)

Sample Site: Edmonton **Sample No:** ED0915-02
Sample Location: Residential **Sample Volume:** 324 m^3
Sample Address: 127 St-133 Ave.

Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)
PCB 77	NDR(142)	0.01
PCB 81	ND	
PCB 105	ND	
PCB 114	127	0.06
PCB 118	2531	0.25
PCB 123	NDR(71)	0.01
PCB 126	ND	
PCB 156	ND	
PCB 157	ND	
PCB 167	309	0.003
PCB 169	ND	
PCB 189	ND	
	Total TEQ=0.34	

PCB Surrogate	Recovery %
13C12-PCB 28	77
13C12-PCB 52	88
13C12-PCB 101	91
13C12-PCB 138	88
13C12-PCB 153	86
13C12-PCB 180	80
13C12-PCB 202	78
13C12-PCB 208	78
13C12-PCB 209	81
13C12-PCB 77	79
13C12-PCB 126	85
13C12-PCB 169	65

Results corrected for surrogate recovery; ND=Not Detected; TEQ=Toxicity equivalents; NDR=Not Detected, Incorrect Isotope Ratio

Table A45 Dioxin-Like PCBs Sample Analysis Report (1998)

Sample Site: Edmonton **Sample No:** EH1021-01
Sample Location: Reimer **Sample Volume:** 373 m^3
Sample Address: 160 St 128 Ave

Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)
PCB 77	402	0.04
PCB 81	ND	
PCB 105	1206	0.12
PCB 114	118	0.06
PCB 118	2386	0.24
PCB 123	121	0.01
PCB 126	102	10.19
PCB 156	247	0.12
PCB 157	ND	
PCB 167	322	0.003
PCB 169	ND	
PCB 189	182	0.02
	Total TEQ= 10.80	
PCB Surrogate	**Recovery %**	
13C12-PCB 28	73	
13C12-PCB 52	70	
13C12-PCB 101	64	
13C12-PCB 138	96	
13C12-PCB 153	86	
13C12-PCB 180	57	
13C12-PCB 202	79	
13C12-PCB 208	87	
13C12-PCB 209	58	
13C12-PCB 77	95	
13C12-PCB 126	99	
13C12-PCB 169	123	

Results corrected for surrogate recovery; ND=Not Detected; TEQ=Toxicity equivalents;
NDR=Not Detected, Incorrect Isotope Ratio

Table A46 Dioxin-Like PCBs Sample Analysis Report (1998)

Sample Site: Edmonton **Sample No:** ED1021-02
Sample Location: Reimer **Sample Volume:** 357 m^3
Sample Address: 160 St 128 Ave

Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)
PCB 77	190	0.02
PCB 81	ND	
PCB 105	448	0.04
PCB 114	90	0.04
PCB 118	1345	0.13
PCB 123	ND	
PCB 126	62	6.16
PCB 156	216	0.11
PCB 157	ND	
PCB 167	ND	
PCB 169	ND	
PCB 189	ND	
		Total TEQ=6.51
PCB Surrogate	**Recovery %**	
13C12-PCB 28	63	
13C12-PCB 52	62	
13C12-PCB 101	44	
13C12-PCB 138	74	
13C12-PCB 153	72	
13C12-PCB 180	78	
13C12-PCB 202	72	
13C12-PCB 208	91	
13C12-PCB 209	45	
13C12-PCB 77	78	
13C12-PCB 126	80	
13C12-PCB 169	72	

Results corrected for surrogate recovery; ND=Not Detected; TEQ=Toxicity equivalents;
NDR=Not Detected, Incorrect Isotope Ratio

Table A47 Dioxin-Like PCBs Sample Analysis Report (1998)

Sample Site: Exshaw **Sample No:** EX0731-01
Sample Location: Wildlife Lot **Sample Volume:** 313 m^3
Sample Address: Exshaw

Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)
PCB 77	927	0.09
PCB 81	ND	
PCB 105	7668	0.77
PCB 114	319	0.16
PCB 118	17252	1.73
PCB 123	607	0.06
PCB 126	ND	
PCB 156	447	0.22
PCB 157	ND	
PCB 167	1150	0.01
PCB 169	ND	
PCB 189	ND	
		Total TEQ=3.04
PCB Surrogate	Recovery %	
13C12-PCB 28	62	
13C12-PCB 52	67	
13C12-PCB 101	68	
13C12-PCB 138	73	
13C12-PCB 153	71	
13C12-PCB 180	92	
13C12-PCB 202	75	
13C12-PCB 208	76	
13C12-PCB 209	27	
13C12-PCB 77	77	
13C12-PCB 126	94	
13C12-PCB 169	107	

Results corrected for surrogate recovery; ND=Not Detected; TEQ=Toxicity equivalents; NDR=Not Detected, Incorrect Isotope Ratio

Table A48 Dioxin-Like PCBs Sample Analysis Report (1998)

Sample Site:	Exshaw	**Sample No:**	EX0731-02
Sample Location:	Wildlife Lot	**Sample Volume:**	316 m^3
Sample Address:	Exshaw		

Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)
PCB 77	ND	
PCB 81	ND	
PCB 105	538	0.05
PCB 114	NDR(82)	0.04
PCB 118	1424	0.14
PCB 123	ND	
PCB 126	ND	
PCB 156	NDR(177)	0.09
PCB 157	ND	
PCB 167	199	0.002
PCB 169	ND	
PCB 189	ND	
	Total TEQ=0.33	

PCB Surrogate	Recovery %
13C12-PCB 28	72
13C12-PCB 52	77
13C12-PCB 101	74
13C12-PCB 138	86
13C12-PCB 153	85
13C12-PCB 180	91
13C12-PCB 202	78
13C12-PCB 208	82
13C12-PCB 209	56
13C12-PCB 77	77
13C12-PCB 126	96
13C12-PCB 169	117

Results corrected for surrogate recovery; ND=Not Detected; TEQ=Toxicity equivalents; NDR=Not Detected, Incorrect Isotope Ratio

Table A49 Dioxin-Like PCBs Sample Analysis Report (1998)

Sample Site:	Fort Saskatchewan	**Sample No:**	FS1006-01
Sample Location:	Industrial	**Sample Volume:**	341 m^3
Sample Address:	AENV Site		

Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)
PCB 77	ND	
PCB 81	ND	
PCB 105	792	0.08
PCB 114	135	0.07
PCB 118	1965	0.20
PCB 123	ND	
PCB 126	ND	
PCB 156	ND	
PCB 157	ND	
PCB 167	229	0.002
PCB 169	ND	
PCB 189	ND	
	Total TEQ=0.35	

PCB Surrogate	Recovery %
13C12-PCB 28	74
13C12-PCB 52	80
13C12-PCB 101	66
13C12-PCB 138	66
13C12-PCB 153	65
13C12-PCB 180	61
13C12-PCB 202	73
13C12-PCB 208	78
13C12-PCB 209	105
13C12-PCB 77	65
13C12-PCB 126	63
13C12-PCB 169	75

Results corrected for surrogate recovery; ND=Not Detected; TEQ=Toxicity equivalents;
NDR=Not Detected, Incorrect Isotope Ratio

Table A50 Dioxin-Like PCBs Sample Analysis Report (1998)

Sample Site: Fort Saskatchewan **Sample No:** FS1006-02
Sample Location: Industrial **Sample Volume:** 374 m^3
Sample Address: AENV Site

Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)
PCB 77	139	0.01
PCB 81	ND	
PCB 105	1283	0.13
PCB 114	136	0.07
PCB 118	3209	0.32
PCB 123	115	0.01
PCB 126	ND	
PCB 156	ND	
PCB 157	ND	
PCB 167	428	0.004
PCB 169	ND	
PCB 189	ND	
	Total TEQ=0.55	
PCB Surrogate	**Recovery %**	
13C12-PCB 28	84	
13C12-PCB 52	72	
13C12-PCB 101	48	
13C12-PCB 138	90	
13C12-PCB 153	101	
13C12-PCB 180	58	
13C12-PCB 202	55	
13C12-PCB 208	94	
13C12-PCB 209	68	
13C12-PCB 77	95	
13C12-PCB 126	118	
13C12-PCB 169	113	

Results corrected for surrogate recovery; ND=Not Detected; TEQ=Toxicity equivalents;
NDR=Not Detected, Incorrect Isotope Ratio

Table A51 Dioxin-Like PCBs Sample Analysis Report (1998)

Sample Site: Swan Hills **Sample No:** SH0909-01
Sample Location: Bovar **Sample Volume:** 329 m^3
Sample Address: Weather Station

Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)
PCB 77	881	0.09
PCB 81	ND	
PCB 105	8207	0.82
PCB 114	456	0.23
PCB 118	17021	1.70
PCB 123	912	0.09
PCB 126	271	27.05
PCB 156	1064	0.53
PCB 157	ND	
PCB 167	2705	0.03
PCB 169	ND	
PCB 189	ND	
		Total TEQ=30.54
PCB Surrogate	**Recovery %**	
13C12-PCB 28	65	
13C12-PCB 52	73	
13C12-PCB 101	64	
13C12-PCB 138	78	
13C12-PCB 153	77	
13C12-PCB 180	87	
13C12-PCB 202	79	
13C12-PCB 208	78	
13C12-PCB 209	37	
13C12-PCB 77	68	
13C12-PCB 126	84	
13C12-PCB 169	81	

Results corrected for surrogate recovery; ND=Not Detected; TEQ=Toxicity equivalents;
NDR=Not Detected, Incorrect Isotope Ratio

Table A52 Dioxin-Like PCBs Sample Analysis Report (1998)

Sample Site: Swan Hills **Sample No:** SH0909-02
Sample Location: Bovar **Sample Volume:** 355 m^3
Sample Address: Weather Station

Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)
PCB 77	1775	0.18
PCB 81	273	0.03
PCB 105	11831	1.18
PCB 114	479	0.24
PCB 118	27042	2.70
PCB 123	1465	0.15
PCB 126	197	19.72
PCB 156	986	0.49
PCB 157	ND	
PCB 167	3099	0.03
PCB 169	ND	
PCB 189	99	0.01
	Total TEQ=24.73	

PCB Surrogate	Recovery %
13C12-PCB 28	71
13C12-PCB 52	74
13C12-PCB 101	59
13C12-PCB 138	86
13C12-PCB 153	83
13C12-PCB 180	84
13C12-PCB 202	66
13C12-PCB 208	69
13C12-PCB 209	43
13C12-PCB 77	75
13C12-PCB 126	98
13C12-PCB 169	101

Results corrected for surrogate recovery; ND=Not Detected; TEQ=Toxicity equivalents;
NDR=Not Detected, Incorrect Isotope Ratio

Table A53 Dioxin-Like PCBs Sample Analysis Report (1998)

Sample Site:	Wainwright	**Sample No:**	WT0930-01
Sample Location:	Waste Treatment Plant	**Sample Volume:**	332 m^3
Sample Address:	Wainwright		

Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)
PCB 77	184	0.02
PCB 81	ND	
PCB 105	633	0.06
PCB 114	75	0.04
PCB 118	1265	0.13
PCB 123	42	0.004
PCB 126	127	12.65
PCB 156	127	0.06
PCB 157	ND	
PCB 167	139	0.001
PCB 169	ND	
PCB 189	ND	
	Total TEQ=12.97	
PCB Surrogate	**Recovery %**	
13C12-PCB 28	70	
13C12-PCB 52	75	
13C12-PCB 101	105	
13C12-PCB 138	91	
13C12-PCB 153	89	
13C12-PCB 180	95	
13C12-PCB 202	75	
13C12-PCB 208	85	
13C12-PCB 209	61	
13C12-PCB 77	94	
13C12-PCB 126	105	
13C12-PCB 169	100	

Results corrected for surrogate recovery; ND=Not Detected; TEQ=Toxicity equivalents;
NDR=Not Detected, Incorrect Isotope Ratio

Table A54 Dioxin-Like PCBs Sample Analysis Report (1998)

Sample Site:	Wainwright	**Sample No:**	WT0930-02
Sample Location:	Waste Treatment Plant	**Sample Volume:**	355 m^3
Sample Address:	Wainwright		

Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)
PCB 77	96	0.01
PCB 81	ND	
PCB 105	423	0.04
PCB 114	65	0.03
PCB 118	1211	0.12
PCB 123	ND	
PCB 126	ND	
PCB 156	ND	
PCB 157	ND	
PCB 167	ND	
PCB 169	ND	
PCB 189	ND	
		Total TEQ=0.21

PCB Surrogate	Recovery %
13C12-PCB 28	96
13C12-PCB 52	101
13C12-PCB 101	100
13C12-PCB 138	85
13C12-PCB 153	85
13C12-PCB 180	87
13C12-PCB 202	82
13C12-PCB 208	99
13C12-PCB 209	118
13C12-PCB 77	81
13C12-PCB 126	81
13C12-PCB 169	93

Results corrected for surrogate recovery; ND=Not Detected; TEQ=Toxicity equivalents;
NDR=Not Detected, Incorrect Isotope Ratio

Table A55 Dioxin-Like PCBs Sample Analysis Report (1998)

Sample Site: Vegreville **Sample No:** VE0930-GB
Sample Location: Glassware Blank **Sample Volume:** m^3
Sample Address:

Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)
PCB 77	ND	
PCB 81	ND	
PCB 105	ND	
PCB 114	ND	
PCB 118	58	0.01
PCB 123	ND	
PCB 126	ND	
PCB 156	ND	
PCB 157	ND	
PCB 167	ND	
PCB 169	ND	
PCB 189	ND	
	Total TEQ=0.01	
PCB Surrogate	**Recovery %**	
13C12-PCB 28	25	
13C12-PCB 52	37	
13C12-PCB 101	70	
13C12-PCB 138	71	
13C12-PCB 153	68	
13C12-PCB 180	45	
13C12-PCB 202	45	
13C12-PCB 208	62	
13C12-PCB 209	27	
13C12-PCB 77	69	
13C12-PCB 126	79	
13C12-PCB 169	111	

Results corrected for surrogate recovery; ND=Not Detected; TEQ=Toxicity equivalents;
NDR=Not Detected, Incorrect Isotope Ratio

TableA56 Dioxin-Like PCBs Sample Analysis Report (1998)

Sample Site: Vegreville **Sample No:** VE0930-SP
Sample Location: Spike **Sample Volume:** m^3
Sample Address:

Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)
PCB 77	930	0.09
PCB 81	1200	0.12
PCB 105	12000	1.20
PCB 114	12000	6.00
PCB 118	11000	1.10
PCB 123	12000	1.20
PCB 126	9600	960.00
PCB 156	9800	4.90
PCB 157	10000	5.00
PCB 167	12000	0.12
PCB 169	9400	94.00
PCB 189	9500	0.95
		Total TEQ=1074.68

PCB Surrogate	Recovery %
13C12-PCB 28	66
13C12-PCB 52	70
13C12-PCB 101	61
13C12-PCB 138	99
13C12-PCB 153	107
13C12-PCB 180	103
13C12-PCB 202	70
13C12-PCB 208	82
13C12-PCB 209	79
13C12-PCB 77	89
13C12-PCB 126	109
13C12-PCB 169	122

Results corrected for surrogate recovery; ND=Not Detected; TEQ=Toxicity equivalents;
NDR=Not Detected, Incorrect Isotope Ratio

Table A57 Dioxin-Like PCBs Sample Analysis Report (1998)

Sample Site: Vegreville **Sample No:** VE1214-01
Sample Location: PUF Blank #1 **Sample Volume:** m^3
Sample Address:

Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)
PCB 77	ND	
PCB 81	ND	
PCB 105	ND	
PCB 114	ND	
PCB 118	95	0.01
PCB 123	ND	
PCB 126	ND	
PCB 156	ND	
PCB 157	ND	
PCB 167	ND	
PCB 169	ND	
PCB 189	ND	
	Total TEQ=0.01	
PCB Surrogate	**Recovery %**	
13C12-PCB 28	57	
13C12-PCB 52	55	
13C12-PCB 101	30	
13C12-PCB 138	88	
13C12-PCB 153	81	
13C12-PCB 180	82	
13C12-PCB 202	61	
13C12-PCB 208	70	
13C12-PCB 209	44	
13C12-PCB 77	74	
13C12-PCB 126	98	
13C12-PCB 169	97	

Results corrected for surrogate recovery; ND=Not Detected; TEQ=Toxicity equivalents;
NDR=Not Detected, Incorrect Isotope Ratio

Table A58 Dioxin-Like PCBs Sample Analysis Report (1998)

Sample Site: Vegreville **Sample No:** VE1214-02
Sample Location: PUF Blank #2 **Sample Volume:** m^3
Sample Address:

Congener	Concentration (fg/m^3) femtogram/m^3	TEQ (fg/m^3)
PCB 77	ND	
PCB 81	ND	
PCB 105	ND	
PCB 114	ND	
PCB 118	ND	
PCB 123	ND	
PCB 126	ND	
PCB 156	ND	
PCB 157	ND	
PCB 167	ND	
PCB 169	ND	
PCB 189	ND	
		Total TEQ=0.00
PCB Surrogate	**Recovery %**	
13C12-PCB 28	55	
13C12-PCB 52	63	
13C12-PCB 101	59	
13C12-PCB 138	69	
13C12-PCB 153	64	
13C12-PCB 180	66	
13C12-PCB 202	56	
13C12-PCB 208	75	
13C12-PCB 209	51	
13C12-PCB 77	66	
13C12-PCB 126	63	
13C12-PCB 169	72	

Results corrected for surrogate recovery; ND=Not Detected; TEQ=Toxicity equivalents;
NDR=Not Detected, Incorrect Isotope Ratio

Appendix 6 Analytical Results for Total PCB Sampling

Table A59 Total PCB Analysis Report (1998)

Sample Site: Calgary
Sample Location: AENV Site
Sample Address: Industrial

Sample No: CA0730-01
Sample Volume: 323 m^3

PCB Congener	Concentration (pg/m^3) picogram/m^3	PCB Congener	Concentration (pg/m^3) picogram/m^3	PCB Homologues	Concentration (pg/m^3) picogram/m^3
PCB 8	65.0	PCB 149	5.6	Di-CBs	ND
PCB 18	86.7	PCB 151	2.1	Tri-CBs	83.6
PCB 28	80.5	PCB 153	5.0	Tetra-CBs	43.3
PCB 33	24.5	PCB 156	0.4	Penta-CBs	15.2
PCB 37	4.0	PCB 157	ND	Hexa-CBs	3.7
PCB 44	14.9	PCB 158	0.5	Hepta-CBs	2.4
PCB 49	15.8	PCB 167	0.7	Octa-CBs	2.7
PCB 52	19.2	PCB 168	ND	Nona-CBs	ND
PCB 66	5.9	PCB 169	ND	Total Homologues	151.7
PCB 70	9.3	PCB 170	1.0	Total Congeners	402.5
PCB 74	4.0	PCB 172	0.2	Total PCBs	557.3
PCB 77	0.2	PCB 177	0.6	% of Congeners in Total	72%
PCB 81	ND	PCB 178	0.3		
PCB 87	4.0	PCB 180	3.1		
PCB 99	4.0	PCB 183	0.7		
PCB 101	11.1	PCB 187	2.0		
PCB 105	1.6	PCB 189	ND		
PCB 110	7.1	PCB 191	ND		
PCB 114	ND	PCB 194	1.5		
PCB 118	3.1	PCB 195	0.4		
PCB 119	ND	PCB 196/203	2.7		
PCB 123	0.2				
PCB 126	ND	PCB 201	0.4		
PCB 128	ND	PCB 202	0.7		
PCB 137	0.3	PCB 205	ND		
PCB 138	5.6	PCB 206	0.8		
PCB 146	0.7	PCB 208	0.3		
		PCB 209	0.2		

Table A60 Total PCB Analysis Report (1998)

Sample Site:	Calgary	**Sample No:**	CA0730-02
Sample Location:	Queens Court Roof	**Sample Volume:**	305 m^3
Sample Address:	Downtown		

PCB Congener	Concentration (pg/m^3) picogram/m^3	PCB Congener	Concentration (pg/m^3) picogram/m^3	PCB Homologues	Concentration (pg/m^3) picogram/m^3
PCB 8	114.8	PCB 149	557.4	Di-CBs	ND
PCB 18	524.6	PCB 151	213.1	Tri-CBs	491.8
PCB 28	1311.5	PCB 153	360.7	Tetra-CBs	2950.8
PCB 33	311.5	PCB 156	17.0	Penta-CBs	2983.6
PCB 37	101.6	PCB 157	2.2	Hexa-CBs	623.0
PCB 44	1409.8	PCB 158	36.1	Hepta-CBs	131.1
PCB 49	1114.8	PCB 167	39.3	Octa-CBs	23.0
PCB 52	1868.9	PCB 168	ND	Nona-CBs	ND
PCB 66	885.2	PCB 169	ND	Total Homologues	7213.1
PCB 70	1541.0	PCB 170	20.0	Total Congeners	17049.2
PCB 74	623.0	PCB 172	4.3	Total PCBs	24262.3
PCB 77	75.4	PCB 177	23.3	% of Congeners in Total	70%
PCB 81	9.2	PCB 178	9.2		
PCB 87	721.3	PCB 180	59.0		
PCB 99	590.2	PCB 183	21.6		
PCB 101	1704.9	PCB 187	52.5		
PCB 105	236.1	PCB 189	NDR(0.5)		
PCB 110	1245.9	PCB 191	NDR(1.0)		
PCB 114	16.7	PCB 194	8.5		
PCB 118	590.2	PCB 195	4.3		
PCB 119	17.0	PCB 196/203	18.0		
PCB 123	26.9				
PCB 126	1.6	PCB 201	7.2		
PCB 128	10.5	PCB 202	9.2		
PCB 137	30.5	PCB 205	0.2		
PCB 138	459.0	PCB 206	NDR(1.3)		
PCB 146	59.0	PCB 208	1.1		
		PCB 209	ND		

Table A61 Total PCB Analysis Report (1998)

Sample Site:	Edmonton	**Sample No:**	ED0915-01
Sample Location:	Industrial	**Sample Volume:**	334 m^3
Sample Address:	17th St.		

PCB Congener	Concentration (pg/m^3) picogram/m^3	PCB Congener	Concentration (pg/m^3) picogram/m^3	PCB Homologues	Concentration (pg/m^3) picogram/m^3
PCB 8	19.2	PCB 149	5.7	Di-CBs	11.4
PCB 18	24.9	PCB 151	1.9	Tri-CBs	21.3
PCB 28	35.9	PCB 153	4.2	Tetra-CBs	22.2
PCB 33	13.2	PCB 156	0.1	Penta-CBs	2.5
PCB 37	2.6	PCB 157	ND	Hexa-CBs	3.9
PCB 44	9.0	PCB 158	0.3	Hepta-CBs	4.2
PCB 49	7.8	PCB 167	0.4	Octa-CBs	ND
PCB 52	9.6	PCB 168	ND	Nona-CBs	ND
PCB 66	4.5	PCB 169	ND	Total Homologues	65.9
PCB 70	6.0	PCB 170	0.7	Total Congeners	185.6
PCB 74	2.8	PCB 172	ND	Total PCBs	251.5
PCB 77	0.4	PCB 177	0.7	% of Congeners in Total	74%
PCB 81	ND	PCB 178	0.4		
PCB 87	3.0	PCB 180	2.2		
PCB 99	2.4	PCB 183	1.2		
PCB 101	8.4	PCB 187	2.6		
PCB 105	1.1	PCB 189	ND		
PCB 110	5.1	PCB 191	ND		
PCB 114	0.1	PCB 194	NDR(0.7)		
PCB 118	2.6	PCB 195	NDR(0.2)		
PCB 119	NDR(0.1)	PCB 196/203	1.0		
PCB 123	NDR(0.1)				
PCB 126	ND	PCB 201	0.2		
PCB 128	0.1	PCB 202	0.2		
PCB 137	NDR(0.1)	PCB 205	ND		
PCB 138	NDR(3.9)	PCB 206	0.2		
PCB 146	0.7	PCB 208	0.1		
		PCB 209	ND		

Table A62 Total PCB Analysis Report (1998)

Sample Site:	Edmonton	**Sample No:**	ED0915-02
Sample Location:	Residential	**Sample Volume:**	324 m^3
Sample Address:	127 St 133a Ave		

PCB Congener	Concentration (pg/m^3) picogram/m^3	PCB Congener	Concentration (pg/m^3) picogram/m^3	PCB Homologues	Concentration (pg/m^3) picogram/m^3
PCB 8	30.9	PCB 149	7.4	Di-CBs	19.4
PCB 18	37.0	PCB 151	2.7	Tri-CBs	34.0
PCB 28	46.3	PCB 153	4.9	Tetra-CBs	22.5
PCB 33	16.7	PCB 156	ND	Penta-CBs	7.7
PCB 37	2.9	PCB 157	ND	Hexa-CBs	4.9
PCB 44	9.9	PCB 158	0.5	Hepta-CBs	0.3
PCB 49	9.0	PCB 167	0.5	Octa-CBs	ND
PCB 52	9.0	PCB 168	ND	Nona-CBs	ND
PCB 66	4.0	PCB 169	ND	Total Homologues	89.5
PCB 70	5.2	PCB 170	0.7	Total Congeners	231.5
PCB 74	2.5	PCB 172	ND	Total PCBs	308.6
PCB 77	NDR(0.3)	PCB 177	0.6	% of Congeners in Total	75%
PCB 81	ND	PCB 178	0.3		
PCB 87	3.1	PCB 180	2.2		
PCB 99	3.1	PCB 183	1.0		
PCB 101	8.0	PCB 187	2.4		
PCB 105	1.3	PCB 189	ND		
PCB 110	7.1	PCB 191	ND		
PCB 114	0.1	PCB 194	0.7		
PCB 118	3.7	PCB 195	0.2		
PCB 119	ND	PCB 196/203	NDR(1.1)		
PCB 123	ND				
PCB 126	ND	PCB 201	0.3		
PCB 128	0.2	PCB 202	0.4		
PCB 137	0.2	PCB 205	ND		
PCB 138	4.9	PCB 206	0.2		
PCB 146	0.9	PCB 208	ND		
		PCB 209	ND		

Table A63 Total PCB Analysis Report (1998)

Sample Site:	Edmonton	**Sample No:**	ED1021-01
Sample Location:	Reimer	**Sample Volume:**	373 m^3
Sample Address:	160 St 128 Ave		

PCB Congener	Concentration (pg/m^3) Picogram/m^3	PCB Congener	Concentration (pg/m^3) picogram/m^3	PCB Homologues	Concentration (pg/m^3) picogram/m^3
PCB 8	32.2	PCB 149	4.0	Di-CBs	40.2
PCB 18	34.9	PCB 151	1.3	Tri-CBs	29.5
PCB 28	42.9	PCB 153	3.8	Tetra-CBs	24.7
PCB 33	16.1	PCB 156	0.2	Penta-CBs	7.8
PCB 37	4.0	PCB 157	ND	Hexa-CBs	2.3
PCB 44	8.8	PCB 158	0.4	Hepta-CBs	3.8
PCB 49	7.2	PCB 167	0.3	Octa-CBs	ND
PCB 52	9.4	PCB 168	ND	Nona-CBs	ND
PCB 66	4.0	PCB 169	ND	Total Homologues	107.2
PCB 70	NDR(5.4)	PCB 170	1.0	Total Congeners	214.5
PCB 74	2.9	PCB 172	ND	Total PCBs	321.7
PCB 77	0.4	PCB 177	0.6	% of Congeners in Total	67%
PCB 81	ND	PCB 178	0.4		
PCB 87	2.6	PCB 180	2.3		
PCB 99	2.4	PCB 183	1.0		
PCB 101	8.3	PCB 187	2.2		
PCB 105	1.2	PCB 189	0.2		
PCB 110	4.8	PCB 191	ND		
PCB 114	0.1	PCB 194	NDR(1.02)		
PCB 118	2.4	PCB 195	ND		
PCB 119	0.1	PCB 196/203	0.7		
PCB 123	0.1				
PCB 126	0.1	PCB 201	ND		
PCB 128	0.2	PCB 202	ND		
PCB 137	0.2	PCB 205	ND		
PCB 138	3.8	PCB 206	0.2		
PCB 146	0.6	PCB 208	NDR(0.1)		
		PCB 209	NDR(0.2)		

Table A64 Total PCB Analysis Report (1998)

Sample Site:	Edmonton	**Sample No:**	ED1021-02
Sample Location:	Reimer	**Sample Volume:**	357 m^3
Sample Address:	160 St 128 Ave		

PCB Congener	Concentration (pg/m^3) picogram/m^3	PCB Congener	Concentration (pg/m^3) picogram/m^3	PCB Homologues	Concentration (pg/m^3) picogram/m^3
PCB 8	12.6	PCB 149	2.0	Di-CBs	12.3
PCB 18	17.9	PCB 151	0.8	Tri-CBs	13.7
PCB 28	19.0	PCB 153	1.5	Tetra-CBs	10.6
PCB 33	7.6	PCB 156	0.2	Penta-CBs	4.2
PCB 37	1.9	PCB 157	ND	Hexa-CBs	0.6
PCB 44	4.2	PCB 158	ND	Hepta-CBs	0.5
PCB 49	3.6	PCB 167	ND	Octa-CBs	ND
PCB 52	5.0	PCB 168	ND	Nona-CBs	ND
PCB 66	1.9	PCB 169	ND	Total Homologues	42.0
PCB 70	NDR(2.8)	PCB 170	0.6	Total Congeners	98.0
PCB 74	1.4	PCB 172	NDR(0.1)	Total PCBs	140.1
PCB 77	0.2	PCB 177	0.2	% of Congeners in Total	70%
PCB 81	ND	PCB 178	ND		
PCB 87	1.1	PCB 180	0.8		
PCB 99	1.1	PCB 183	0.3		
PCB 101	4.2	PCB 187	0.6		
PCB 105	0.4	PCB 189	ND		
PCB 110	2.0	PCB 191	ND		
PCB 114	0.1	PCB 194	NDR(0.4)		
PCB 118	1.3	PCB 195	ND		
PCB 119	ND	PCB 196/203	0.3		
PCB 123	ND				
PCB 126	0.1	PCB 201	ND		
PCB 128	ND	PCB 202	ND		
PCB 137	ND	PCB 205	ND		
PCB 138	1.7	PCB 206	ND		
PCB 146	0.3	PCB 208	ND		
		PCB 209	ND		

Table A65 Total PCB Analysis Report (1998)

Sample Site:	Exshaw	**Sample No:**	EX0731-01
Sample Location:	Wildlife Lot	**Sample Volume:**	313 m^3
Sample Address:	Exshaw		

PCB Congener	Concentration (pg/m^3) picogram/m^3	PCB Congener	Concentration (pg/m^3) picogram/m^3	PCB Homologues	Concentration (pg/m^3) picogram/m^3
PCB 8	10.2	PCB 149	15.7	Di-CBs	ND
PCB 18	14.4	PCB 151	4.5	Tri-CBs	15.3
PCB 28	28.8	PCB 153	13.4	Tetra-CBs	25.6
PCB 33	9.6	PCB 156	0.4	Penta-CBs	31.9
PCB 37	2.8	PCB 157	ND	Hexa-CBs	13.1
PCB 44	10.2	PCB 158	1.4	Hepta-CBs	4.8
PCB 49	8.0	PCB 167	1.2	Octa-CBs	1.4
PCB 52	11.2	PCB 168	ND	Nona-CBs	ND
PCB 66	9.9	PCB 169	ND	Total Homologues	92.7
PCB 70	16.0	PCB 170	0.5	Total Congeners	287.5
PCB 74	5.8	PCB 172	0.2	Total PCBs	383.4
PCB 77	0.9	PCB 177	0.7	% of Congeners in Total	75%
PCB 81	ND	PCB 178	0.4		
PCB 87	11.5	PCB 180	2.1		
PCB 99	8.9	PCB 183	0.6		
PCB 101	24.6	PCB 187	2.1		
PCB 105	7.7	PCB 189	ND		
PCB 110	23.6	PCB 191	ND		
PCB 114	0.3	PCB 194	NDR(0.6)		
PCB 118	17.3	PCB 195	0.2		
PCB 119	0.2	PCB 196/203	1.0		
PCB 123	0.6				
PCB 126	ND	PCB 201	0.3		
PCB 128	ND	PCB 202	0.4		
PCB 137	0.8	PCB 205	ND		
PCB 138	15.7	PCB 206	0.3		
PCB 146	2.0	PCB 208	ND		
		PCB 209	ND		

Table A66 Total PCB Analysis Report (1998)

Sample Site:	Exshaw	**Sample No:**	EX0731-02
Sample Location:	Wildlife Lot	**Sample Volume:**	317 m^3
Sample Address:	Exshaw		

PCB Congener	Concentration (pg/m^3) picogram/m^3	PCB Congener	Concentration (pg/m^3) picogram/m^3	PCB Homologues	Concentration (pg/m^3) picogram/m^3
PCB 8	14.2	PCB 149	2.2	Di-CBs	ND
PCB 18	18.0	PCB 151	0.9	Tri-CBs	21.8
PCB 28	27.8	PCB 153	2.2	Tetra-CBs	13.6
PCB 33	8.8	PCB 156	NDR(0.2)	Penta-CBs	5.0
PCB 37	1.7	PCB 157	ND	Hexa-CBs	0.7
PCB 44	4.7	PCB 158	0.2	Hepta-CBs	1.2
PCB 49	4.4	PCB 167	0.3	Octa-CBs	1.5
PCB 52	5.0	PCB 168	ND	Nona-CBs	ND
PCB 66	2.0	PCB 169	ND	Total Homologues	44.2
PCB 70	2.6	PCB 170	0.3	Total Congeners	116.7
PCB 74	1.3	PCB 172	ND	Total PCBs	160.9
PCB 77	ND	PCB 177	0.3	% of Congeners in Total	73%
PCB 81	ND	PCB 178	0.2		
PCB 87	1.1	PCB 180	1.5		
PCB 99	1.5	PCB 183	0.3		
PCB 101	4.4	PCB 187	0.8		
PCB 105	0.5	PCB 189	ND		
PCB 110	2.8	PCB 191	ND		
PCB 114	NDR(0.1)	PCB 194	0.6		
PCB 118	1.4	PCB 195	0.2		
PCB 119	ND	PCB 196/203	1.6		
PCB 123	ND				
PCB 126	ND	PCB 201	0.2		
PCB 128	ND	PCB 202	0.4		
PCB 137	NDR(0.1)	PCB 205	ND		
PCB 138	2.1	PCB 206	0.3		
PCB 146	NDR(0.3)	PCB 208	NDR(0.2)		
		PCB 209	0.2		

Table A67 Total PCB Analysis Report (1998)

Sample Site:	Fort Saskatchewan	**Sample No:**	FS1006-01
Sample Location:	AENV Site	**Sample Volume:**	341 m^3
Sample Address:	Industrial		

PCB Congener	Concentration (pg/m^3) picogram/m^3	PCB Congener	Concentration (pg/m^3) picogram/m^3	PCB Homologues	Concentration (pg/m^3) picogram/m^3
PCB 8	19.1	PCB 149	3.2	Di-CBs	10.0
PCB 18	15.8	PCB 151	1.0	Tri-CBs	15.8
PCB 28	23.2	PCB 153	2.0	Tetra-CBs	15.2
PCB 33	8.2	PCB 156	ND	Penta-CBs	6.5
PCB 37	1.4	PCB 157	ND	Hexa-CBs	1.2
PCB 44	6.2	PCB 158	ND	Hepta-CBs	0.5
PCB 49	5.3	PCB 167	0.2	Octa-CBs	ND
PCB 52	6.5	PCB 168	ND	Nona-CBs	ND
PCB 66	2.9	PCB 169	ND	Total Homologues	49.9
PCB 70	3.8	PCB 170	0.1	Total Congeners	126.1
PCB 74	2.4	PCB 172	ND	Total PCBs	176.0
PCB 77	ND	PCB 177	0.2	% of Congeners in Total	72%
PCB 81	ND	PCB 178	0.2		
PCB 87	2.7	PCB 180	0.6		
PCB 99	2.1	PCB 183	0.4		
PCB 101	5.9	PCB 187	0.8		
PCB 105	0.8	PCB 189	ND		
PCB 110	4.4	PCB 191	ND		
PCB 114	0.1	PCB 194	0.3		
PCB 118	2.0	PCB 195	ND		
PCB 119	ND	PCB 196/203	NDR(0.3)		
PCB 123	ND				
PCB 126	ND	PCB 201	ND		
PCB 128	ND	PCB 202	0.2		
PCB 137	ND	PCB 205	ND		
PCB 138	2.1	PCB 206	ND		
PCB 146	0.4	PCB 208	ND		
		PCB 209	ND		

Table A68 Total PCB Analysis Report (1998)

Sample Site:	Fort Saskatchewan	**Sample No:**	FS1006-02
Sample Location:	AENV Site	**Sample Volume:**	374 m^3
Sample Address:	Industrial		

PCB Congener	Concentration (pg/m^3) picogram/m^3	PCB Congener	Concentration (pg/m^3) picogram/m^3	PCB Homologues	Concentration (pg/m^3) picogram/m^3
PCB 8	NDR(23.3)	PCB 149	NDR(4.3)	Di-CBs	ND
PCB 18	37.4	PCB 151	1.6	Tri-CBs	50.8
PCB 28	64.2	PCB 153	NDR(3.2)	Tetra-CBs	29.4
PCB 33	22.7	PCB 156	ND	Penta-CBs	8.0
PCB 37	4.8	PCB 157	ND	Hexa-CBs	1.7
PCB 44	10.7	PCB 158	0.3	Hepta-CBs	1.7
PCB 49	9.1	PCB 167	0.4	Octa-CBs	ND
PCB 52	13.1	PCB 168	ND	Nona-CBs	ND
PCB 66	NDR(4.5)	PCB 169	ND	Total Homologues	90.9
PCB 70	7.5	PCB 170	0.6	Total Congeners	254.0
PCB 74	3.7	PCB 172	0.2	Total PCBs	347.6
PCB 77	0.1	PCB 177	0.6	% of Congeners in Total	73%
PCB 81	ND	PCB 178	NDR(0.6)		
PCB 87	2.6	PCB 180	NDR(2.1)		
PCB 99	2.1	PCB 183	1.2		
PCB 101	12.3	PCB 187	NDR(3.7)		
PCB 105	1.3	PCB 189	ND		
PCB 110	4.5	PCB 191	ND		
PCB 114	0.1	PCB 194	NDR(0.7)		
PCB 118	3.2	PCB 195	ND		
PCB 119	ND	PCB 196/203	0.8		
PCB 123	0.1				
PCB 126	ND	PCB 201	NDR(0.3)		
PCB 128	ND	PCB 202	0.4		
PCB 137	0.2	PCB 205	ND		
PCB 138	3.5	PCB 206	ND		
PCB 146	0.5	PCB 208	ND		
		PCB 209	ND		

Table A69 Total PCB Analysis Report (1998)

Sample Site:	Swan Hills	**Sample No:**	SH0909-01
Sample Location:	Bovar	**Sample Volume:**	329 m^3
Sample Address:	Weather Station		

PCB Congener	Concentration (pg/m^3) picogram/m^3	PCB Congener	Concentration (pg/m^3) picogram/m^3	PCB Homologues	Concentration (pg/m^3) picogram/m^3
PCB 8	82.1	PCB 149	33.4	Di-CBs	72.9
PCB 18	215.8	PCB 151	13.7	Tri-CBs	218.8
PCB 28	304.0	PCB 153	25.5	Tetra-CBs	194.5
PCB 33	85.1	PCB 156	1.1	Penta-CBs	72.9
PCB 37	24.3	PCB 157	ND	Hexa-CBs	20.7
PCB 44	60.8	PCB 158	2.6	Hepta-CBs	16.1
PCB 49	57.8	PCB 167	2.7	Octa-CBs	ND
PCB 52	60.8	PCB 168	ND	Nona-CBs	ND
PCB 66	36.5	PCB 169	ND	Total Homologues	607.9
PCB 70	48.6	PCB 170	2.7	Total Congeners	1276.6
PCB 74	23.4	PCB 172	0.5	Total PCBs	1884.5
PCB 77	0.9	PCB 177	2.9	% of Congeners in Total	68%
PCB 81	ND	PCB 178	1.3		
PCB 87	16.1	PCB 180	7.3		
PCB 99	14.6	PCB 183	3.6		
PCB 101	51.7	PCB 187	8.2		
PCB 105	8.2	PCB 189	ND		
PCB 110	28.0	PCB 191	0.2		
PCB 114	0.5	PCB 194	1.0		
PCB 118	17.0	PCB 195	0.5		
PCB 119	0.3	PCB 196/203	1.9		
PCB 123	0.9				
PCB 126	0.3	PCB 201	0.5		
PCB 128	0.7	PCB 202	0.8		
PCB 137	0.9	PCB 205	ND		
PCB 138	26.1	PCB 206	NDR(0.3)		
PCB 146	4.3	PCB 208	NDR(0.2)		
		PCB 209	ND		

Table A70 Total PCB Analysis Report (1998)

Sample Site: Swan Hills
Sample Location: Bovar
Sample Address: Weather Station
Sample No: SH0909-02
Sample Volume: 355 m^3

PCB Congener	Concentration (pg/m^3) picogram/m^3	PCB Congener	Concentration (pg/m^3) picogram/m^3	PCB Homologues	Concentration (pg/m^3) picogram/m^3
PCB 8	107.0	PCB 149	70.4	Di-CBs	27.0
PCB 18	338.0	PCB 151	31.0	Tri-CBs	478.9
PCB 28	647.9	PCB 153	47.9	Tetra-CBs	394.4
PCB 33	177.5	PCB 156	1.0	Penta-CBs	118.3
PCB 37	50.7	PCB 157	ND	Hexa-CBs	39.4
PCB 44	112.7	PCB 158	3.1	Hepta-CBs	28.2
PCB 49	115.5	PCB 167	3.1	Octa-CBs	1.2
PCB 52	109.9	PCB 168	ND	Nona-CBs	ND
PCB 66	78.9	PCB 169	ND	Total Homologues	1098.6
PCB 70	81.7	PCB 170	3.4	Total Congeners	2366.2
PCB 74	45.1	PCB 172	0.8	Total PCBs	3380.3
PCB 77	1.8	PCB 177	5.1	% of Congeners in Total	70%
PCB 81	0.3	PCB 178	2.8		
PCB 87	27.0	PCB 180	11.3		
PCB 99	22.3	PCB 183	7.0		
PCB 101	93.0	PCB 187	15.5		
PCB 105	11.8	PCB 189	0.1		
PCB 110	47.9	PCB 191	0.2		
PCB 114	0.5	PCB 194	1.3		
PCB 118	27.0	PCB 195	0.8		
PCB 119	0.5	PCB 196/203	3.1		
PCB 123	1.5				
PCB 126	0.2	PCB 201	0.9		
PCB 128	0.6	PCB 202	1.2		
PCB 137	0.8	PCB 205	ND		
PCB 138	42.3	PCB 206	0.3		
PCB 146	7.3	PCB 208	0.1		
		PCB 209	0.1		

Table A71 Total PCB Analysis Report (1998)

Sample Site:	Wainwright	**Sample No:**	WT0930-01
Sample Location:	Waste Treatment Plant	**Sample Volume:**	332 m^3
Sample Address:	Wainwright		

PCB Congener	Concentration (pg/m^3) picogram/m^3	PCB Congener	Concentration (pg/m^3) picogram/m^3	PCB Homologues	Concentration (pg/m^3) picogram/m^3
PCB 8	15.7	PCB 149	2.3	Di-CBs	6.3
PCB 18	26.8	PCB 151	1.0	Tri-CBs	14.8
PCB 28	22.6	PCB 153	1.9	Tetra-CBs	11.7
PCB 33	8.1	PCB 156	0.1	Penta-CBs	4.5
PCB 37	2.3	PCB 157	ND	Hexa-CBs	1.8
PCB 44	4.5	PCB 158	0.2	Hepta-CBs	0.5
PCB 49	3.6	PCB 167	0.1	Octa-CBs	ND
PCB 52	4.5	PCB 168	ND	Nona-CBs	ND
PCB 66	2.1	PCB 169	ND	Total Homologues	39.2
PCB 70	3.6	PCB 170	0.3	Total Congeners	120.5
PCB 74	1.7	PCB 172	ND	Total PCBs	159.6
PCB 77	0.2	PCB 177	0.2	% of Congeners in Total	75%
PCB 81	ND	PCB 178	0.1		
PCB 87	1.7	PCB 180	0.8		
PCB 99	1.4	PCB 183	0.3		
PCB 101	3.3	PCB 187	0.9		
PCB 105	0.6	PCB 189	ND		
PCB 110	3.3	PCB 191	ND		
PCB 114	0.1	PCB 194	ND		
PCB 118	1.3	PCB 195	ND		
PCB 119	0.1	PCB 196/203	ND		
PCB 123	0.1				
PCB 126	0.1	PCB 201	ND		
PCB 128	ND	PCB 202	ND		
PCB 137	0.1	PCB 205	ND		
PCB 138	1.9	PCB 206	NDR(0.2)		
PCB 146	0.3	PCB 208	NDR(0.1)		
		PCB 209	NDR(0.5)		

Table A72 Total PCB Analysis Report (1998)

Sample Site:	Wainwright	**Sample No:**	WT0930-02
Sample Location:	Waste Treatment Plant	**Sample Volume:**	355 m^3
Sample Address:	Wainwright		

PCB Congener	Concentration (pg/m^3) picogram/m^3	PCB Congener	Concentration (pg/m^3) picogram/m^3	PCB Homologues	Concentration (pg/m^3) picogram/m^3
PCB 8	64.8	PCB 149	3.9	Di-CBs	87.3
PCB 18	56.3	PCB 151	2.0	Tri-CBs	50.7
PCB 28	56.3	PCB 153	3.4	Tetra-CBs	27.3
PCB 33	19.2	PCB 156	ND	Penta-CBs	2.6
PCB 37	3.1	PCB 157	ND	Hexa-CBs	1.8
PCB 44	9.9	PCB 158	ND	Hepta-CBs	2.1
PCB 49	8.7	PCB 167	ND	Octa-CBs	ND
PCB 52	8.5	PCB 168	ND	Nona-CBs	ND
PCB 66	3.1	PCB 169	ND	Total Homologues	171.8
PCB 70	4.5	PCB 170	NDR(0.2)	Total Congeners	264.8
PCB 74	2.6	PCB 172	ND	Total PCBs	450.7
PCB 77	0.1	PCB 177	0.4	% of Congeners in Total	59%
PCB 81	ND	PCB 178	0.3		
PCB 87	1.2	PCB 180	0.8		
PCB 99	1.2	PCB 183	0.8		
PCB 101	3.4	PCB 187	1.5		
PCB 105	0.4	PCB 189	ND		
PCB 110	2.5	PCB 191	ND		
PCB 114	0.1	PCB 194	ND		
PCB 118	1.2	PCB 195	ND		
PCB 119	0.1	PCB 196/203	0.5		
PCB 123	ND				
PCB 126	ND	PCB 201	0.2		
PCB 128	ND	PCB 202	0.3		
PCB 137	ND	PCB 205	ND		
PCB 138	2.0	PCB 206	0.1		
PCB 146	0.3	PCB 208	0.1		
		PCB 209	ND		

Table A73 Total PCB Analysis Report (1998)

Sample Site: Vegreville **Sample No:** VE0930-GB
Sample Location: Glassware Blank **Sample Volume:** m^3
Sample Address:

PCB Congener	Concentration (pg) picogram/m^3	PCB Congener	Concentration (pg) picogram/m^3	PCB Homologues	Concentration (pg) picogram/m^3
PCB 8	ND	PCB 149	63	Di-CBs	ND
PCB 18	NDR(220)	PCB 151	ND	Tri-CBs	ND
PCB 28	230	PCB 153	52	Tetra-CBs	ND
PCB 33	70	PCB 156	ND	Penta-CBs	ND
PCB 37	ND	PCB 157	ND	Hexa-CBs	ND
PCB 44	54	PCB 158	ND	Hepta-CBs	ND
PCB 49	ND	PCB 167	ND	Octa-CBs	ND
PCB 52	110	PCB 168	ND	Nona-CBs	ND
PCB 66	ND	PCB 169	ND	Total Homologues	ND
PCB 70	46	PCB 170	ND	Total Congeners	1200
PCB 74	ND	PCB 172	ND	Total PCBs	1200
PCB 77	ND	PCB 177	ND	% of Congeners in Total	100%
PCB 81	ND	PCB 178	ND		
PCB 87	ND	PCB 180	ND		
PCB 99	ND	PCB 183	ND		
PCB 101	110	PCB 187	ND		
PCB 105	ND	PCB 189	ND		
PCB 110	110	PCB 191	ND		
PCB 114	ND	PCB 194	ND		
PCB 118	58	PCB 195	ND		
PCB 119	ND	PCB 196/203	ND		
PCB 123	ND				
PCB 126	ND	PCB 201	ND		
PCB 128	ND	PCB 202	ND		
PCB 137	ND	PCB 205	ND		
PCB 138	62	PCB 206	ND		
PCB 146	ND	PCB 208	ND		
		PCB 209	ND		

Table A74 Total PCB Analysis Report (1998)

Sample Site: Vegreville **Sample No:** VE0930-SP
Sample Location: Spike **Sample Volume:** m^3
Sample Address:

PCB Congener	Recovery (%)	PCB Congener	Recovery (%)	PCB Homologues	Concentration (fg/m^3) femtogram/m^3
PCB 8	81	PCB 149	87	Di-CBs	
PCB 18	100	PCB 151	80	Tri-CBs	
PCB 28	120	PCB 153	100	Tetra-CBs	
PCB 33	110	PCB 156	98	Penta-CBs	
PCB 37	120	PCB 157	100	Hexa-CBs	
PCB 44	89	PCB 158	100	Hepta-CBs	
PCB 49	76	PCB 167	120	Octa-CBs	
PCB 52	89	PCB 168	97	Nona-CBs	
PCB 66	110	PCB 169	94	Total Homologues	
PCB 70	110	PCB 170	91	Total Congeners	
PCB 74	99	PCB 172	94	Total PCBs	
PCB 77	93	PCB 177	91	% of Congeners in Total	
PCB 81	120	PCB 178	110		
PCB 87	85	PCB 180	96		
PCB 99	84	PCB 183	110		
PCB 101	120	PCB 187	130		
PCB 105	120	PCB 189	95		
PCB 110	87	PCB 191	97		
PCB 114	120	PCB 194	130		
PCB 118	110	PCB 195	140		
PCB 119	78	PCB 196/203	135		
PCB 123	120				
PCB 126	96	PCB 201	130		
PCB 128	99	PCB 202	110		
PCB 137	100	PCB 205	130		
PCB 138	110	PCB 206	120		
PCB 146	97	PCB 208	ND		
		PCB 209	140		

TableA75 Total PCB Analysis Report (1998)

Sample Site: Vegreville **Sample No:** VE1214-01
Sample Location: PUF Blank #1 **Sample Volume:** m^3
Sample Address:

PCB Congener	Concentration (pg) picogram/m^3	PCB Congener	Concentration (pg) picogram/m^3	PCB Homologues	Concentration (pg) picogram/m^3
PCB 8	ND	PCB 149	61	Di-CBs	ND
PCB 18	45	PCB 151	ND	Tri-CBs	ND
PCB 28	240	PCB 153	74	Tetra-CBs	ND
PCB 33	NDR(120)	PCB 156	ND	Penta-CBs	220
PCB 37	38	PCB 157	ND	Hexa-CBs	280
PCB 44	190	PCB 158	ND	Hepta-CBs	ND
PCB 49	59	PCB 167	ND	Octa-CBs	ND
PCB 52	180	PCB 168	ND	Nona-CBs	640
PCB 66	NDR(81)	PCB 169	ND	Total Homologues	1100
PCB 70	93	PCB 170	ND	Total Congeners	2900
PCB 74	NDR(77)	PCB 172	ND	Total PCBs	4000
PCB 77	ND	PCB 177	ND	% of Congeners in Total	73%
PCB 81	ND	PCB 178	ND		
PCB 87	ND	PCB 180	ND		
PCB 99	ND	PCB 183	330		
PCB 101	220	PCB 187	ND		
PCB 105	ND	PCB 189	ND		
PCB 110	70	PCB 191	ND		
PCB 114	ND	PCB 194	ND		
PCB 118	95	PCB 195	ND		
PCB 119	ND	PCB 196/203	ND		
PCB 123	ND				
PCB 126	ND	PCB 201	ND		
PCB 128	ND	PCB 202	470		
PCB 137	ND	PCB 205	ND		
PCB 138	69	PCB 206	ND		
PCB 146	ND	PCB 208	ND		
		PCB 209	370		

Table A76 Total PCB Analysis Report (1998)

Sample Site: Vegreville **Sample No:** VE1214-02
Sample Location: PUF Blank #2 **Sample Volume:** m^3
Sample Address:

PCB Congener	Concentration (pg) picogram/m^3	PCB Congener	Concentration (pg) picogram/m^3	PCB Homologues	Concentration (pg) picogram/m^3
PCB 8	170	PCB 149	ND	Di-CBs	ND
PCB 18	NDR(220)	PCB 151	ND	Tri-CBs	ND
PCB 28	320	PCB 153	NDR(87)	Tetra-CBs	150
PCB 33	120	PCB 156	ND	Penta-CBs	77
PCB 37	ND	PCB 157	ND	Hexa-CBs	ND
PCB 44	NDR(150)	PCB 158	ND	Hepta-CBs	ND
PCB 49	100	PCB 167	ND	Octa-CBs	ND
PCB 52	130	PCB 168	ND	Nona-CBs	ND
PCB 66	42	PCB 169	ND	Total Homologues	230
PCB 70	NDR(87)	PCB 170	ND	Total Congeners	1800
PCB 74	56	PCB 172	ND	Total PCBs	2000
PCB 77	ND	PCB 177	ND	% of Congeners in Total	90%
PCB 81	ND	PCB 178	ND		
PCB 87	NDR(63)	PCB 180	ND		
PCB 99	ND	PCB 183	ND		
PCB 101	NDR(84)	PCB 187	ND		
PCB 105	ND	PCB 189	ND		
PCB 110	63	PCB 191	ND		
PCB 114	ND	PCB 194	ND		
PCB 118	ND	PCB 195	ND		
PCB 119	ND	PCB 196/203	ND		
PCB 123	ND				
PCB 126	ND	PCB 201	ND		
PCB 128	ND	PCB 202	ND		
PCB 137	ND	PCB 205	ND		
PCB 138	83	PCB 206	ND		
PCB 146	ND	PCB 208	ND		
		PCB 209	ND		